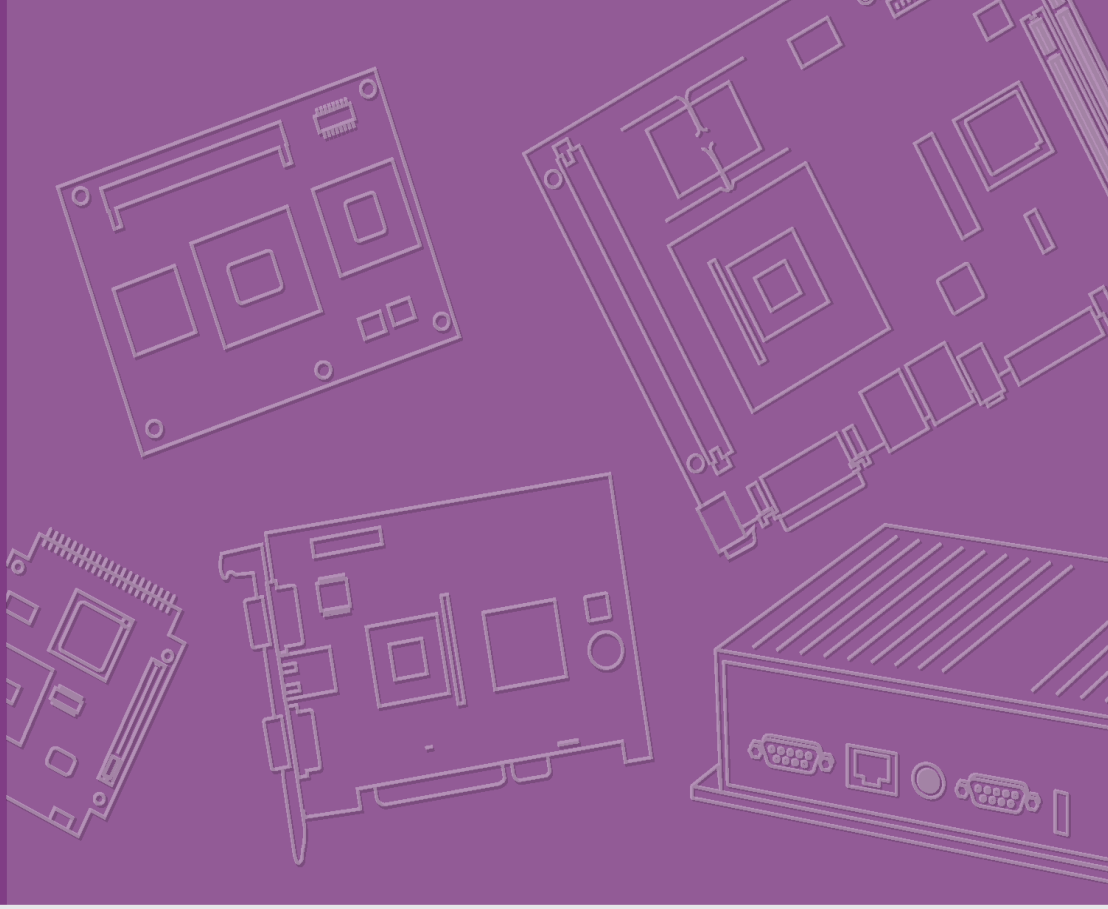

# User Manual

# SOM-7565

ADVANTECH

*Enabling an Intelligent Planet*

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# Product Warranty (2 years)

Advantech warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by Advantech, or which have been subject to misuse, abuse, accident or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

Because of Advantech's high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If an Advantech product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time and freight. Please consult your dealer for more details.

If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any onscreen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain an RMA (return merchandize authorization) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

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# Declaration of Conformity

### CE

This product has passed the CE test for environmental specifications. Test conditions for passing included the equipment being operated within an industrial enclosure. In order to protect the product from being damaged by ESD (Electrostatic Discharge) and EMI leakage, we strongly recommend the use of CE-compliant industrial enclosure products.

### FCC Class B

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

### FM

This equipment has passed the FM certification. According to the National Fire Protection Association, work sites are classified into different classes, divisions and groups, based on hazard considerations. This equipment is compliant with the specifications of Class I, Division 2, Groups A, B, C and D indoor hazards.

# Technical Support and Assistance

1. Visit the Advantech website at http://support.advantech.com where you can find the latest information about the product.
2. Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information ready before you call:
   - Product name and serial number
   - Description of your peripheral attachments
   - Description of your software (operating system, version, application software, etc.)
   - A complete description of the problem
   - The exact wording of any error messages

# Warnings, Cautions and Notes

***Warning!*** *Warnings indicate conditions, which if not observed, can cause personal injury!*

***Caution!*** *Cautions are included to help you avoid damaging hardware or losing data. e.g.*

*There is a danger of a new battery exploding if it is incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.*

***Note!*** *Notes provide optional additional information.*

# Document Feedback

To assist us in making improvements to this manual, we would welcome comments and constructive criticism. Please send all such - in writing to: support@advantech.com

# Packing List

Before setting up the system, check that the items listed below are included and in good condition. If any item does not accord with the table, please contact your dealer immediately.

- SOM-7565 CPU Module
- 1 x Heatspreader (1960055344N001)

# Safety Instructions

1. Read these safety instructions carefully.
2. Keep this User Manual for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall may cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. DO NOT COVER THE OPENINGS.
8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.

9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
12. Never pour any liquid into an opening. This may cause fire or electrical shock.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
14. If one of the following situations arises, get the equipment checked by service personnel:
    - The power cord or plug is damaged.
    - Liquid has penetrated into the equipment.
    - The equipment has been exposed to moisture.
    - The equipment does not work well, or you cannot get it to work according to the user's manual.
    - The equipment has been dropped and damaged.
    - The equipment has obvious signs of breakage.
15. DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE MAY GO BELOW -20° C (-4° F) OR ABOVE 60° C (140° F). THIS COULD DAMAGE THE EQUIPMENT. THE EQUIPMENT SHOULD BE IN A CONTROLLED ENVIRONMENT.
16. CAUTION: DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER, DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.

The sound pressure level at the operator's position according to IEC 704-1:1982 is no more than 70 dB (A).

DISCLAIMER: This set of instructions is given according to IEC 704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.

# Safety Precaution - Static Electricity

Follow these simple precautions to protect yourself from harm and the products from damage.

- To avoid electrical shock, always disconnect the power from your PC chassis before you work on it. Don't touch any components on the CPU card or other cards while the PC is on.
- Disconnect power before making any configuration changes. The sudden rush of power as you connect a jumper or install a card may damage sensitive electronic components.

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# Chapter 1

## General Information

This chapter gives background information on the SOM-7565 CPU Computer on Module

Sections include:

- Introduction
- Specification
- Functional Block Diagram
- SOM-7565 Type 10 Pin Assignment

# 1.1 Introduction

SOM-7565 is a COM-Express Mini module with pin-out Type 10 that fully complies with the PICMG (PCI Industrial Computer Manufactures Group) COM.0 R2.0 specification. The new CPU module uses an Intel Atom processor N2600 which contains Intel GFX Core GMA3600 supports full MPEG2, AVC/H.264, and VC-1 HW decode/acceleration, with NM10 chipset which supports advance expansion interface like PCI Express and I/O interface like Serial ATA (SATA), USB2.0. In a COM-Mini form factor of 84mm x 55mm, SOM-7565 provides a balance of high performance and easy to integrate solution for customers' applications by utilizing a plug-in CPU module on an application-specific customer solution board. With advanced interfaces like PCI Express, SATA, USB 2.0, and HDMI/DVI/DP interfaces, it provides not only high speed/performance but also small pin-count that user easy to integrate in to system. SOM-7565 offers design partners more choices for their own applications needing higher computing speeds while maintaining a compact form factor.

# 1.2 Specifications

## 1.2.1 Board Information

- **Pin Definition:** PICMG COM.0 R2.0 Type 10 pin-out definition
- **Form Factor:** PICMG COM.0 R2.0 Mini Module 84 x 55 mm

## 1.2.2 System Information

- **CPU:** Onboard Intel® Atom N2600 processor 1.6GHz, 1MB L2 Cache
- **Chipset:** Intel® NM10 Express Chipset
- **Memory:** Onboard DDR3 800MHz 2GB memory
- **BIOS:** AMI UEFI 16Mbit SPI BIOS
- **Power management:** Supports power saving modes including Normal / Standby / Suspend modes. ACPI 2.0 compliant

## 1.2.3 Display

- **Graphic Core:** Intel Atom integrated GMA3600 400MHz, supports DX9, OGL3.0, and MPEG2, AVC/H.264, VC-1 HW decode/acceleration
- **LVDS:** Supports 1-CH 18-bit, resolution up to 1366 x 768
- **HDMI/DVI/DP:** Supports 1 port HDMI (default), DVI, or DP multiplexed (BIOS modification needed).
  Resolution: HDMI/DVI up to 1920 x 1200
  DP up to 1600 x 1200
- **Dual Display:** Supports LVDS + HDMI/DVI/DP

## 1.2.4 Expansion Interface

- **PCI Express x1:** 3 ports or 4 ports (BOM option), PCI Express 1.0a compliant
- **Audio Interface:** Intel HD Audio interface
- **LPC Bus**
- **SMBus**
- **I2C Bus:** Up to 400KHz
- **SPI:** Supports SPI BIOS only

### 1.2.5 I/O

- **Onboard Flash:** Support onboard flash 4GB MLC or 2GB SLC
- **Ethernet:** Intel 82574L Gigabit LAN controller supports 10/100/1000 Mbps Speed
- **SATA:** Supports 1 port, SATAII 300 Gb/s compliant (2 port optional while remove onboard flash)
- **USB Interface:** Supports 8 ports USB 2.0
- **Serial Port:** Supports 2 ports 2-wire serial port
- **Express Card:** 2 ports
- **Panel Control:** Supports panel backlight on/off control, brightness control
- **Thermal Protection:** Supports thermal shutdown or CPU throttling
- **Watchdog Timer:** 65536 level timer interval, from 0~65535 sec, multi-level, multi-option watchdog timer
- **Smart Fan:** 1 port
- **GPIO:** 8 GPIO
- **Hardware Monitor:** Vin, 5VSB, CMOS

### 1.2.6 iManager 2.0

Refer to section 4.3.

### 1.2.7 Mechanical and Environmental Specification

- **Dimensions:** 84 x 55 mm (3.3" x 2.17")
- **Power Type and Supply Voltage:**
  ATX: +12V and +5VSB (standby power)
  AT: +12V
- **Power Requirement:**
  Test Condition: Win7 32-bit standard, under 12V and 5VSB input power supply.
  Idle: 7.65W
  Max: 9.57W (Burn-in Test V6.0 Pro)
  **Temperature Specification:**
  Operating: 0 ~ 60°C (32 ~ 140°F)
  Storage: -40 ~ 85°C (-40 ~ 185°F)
- **Humidity Specification:**
  Operating: 40°C@95% relative humidity, non-condensing
  Storage: 60°C@95%relative humidity, non-condensing
- **EMC Compliance:**
  CE/FCC Class B

## 1.3 Functional Block Diagram

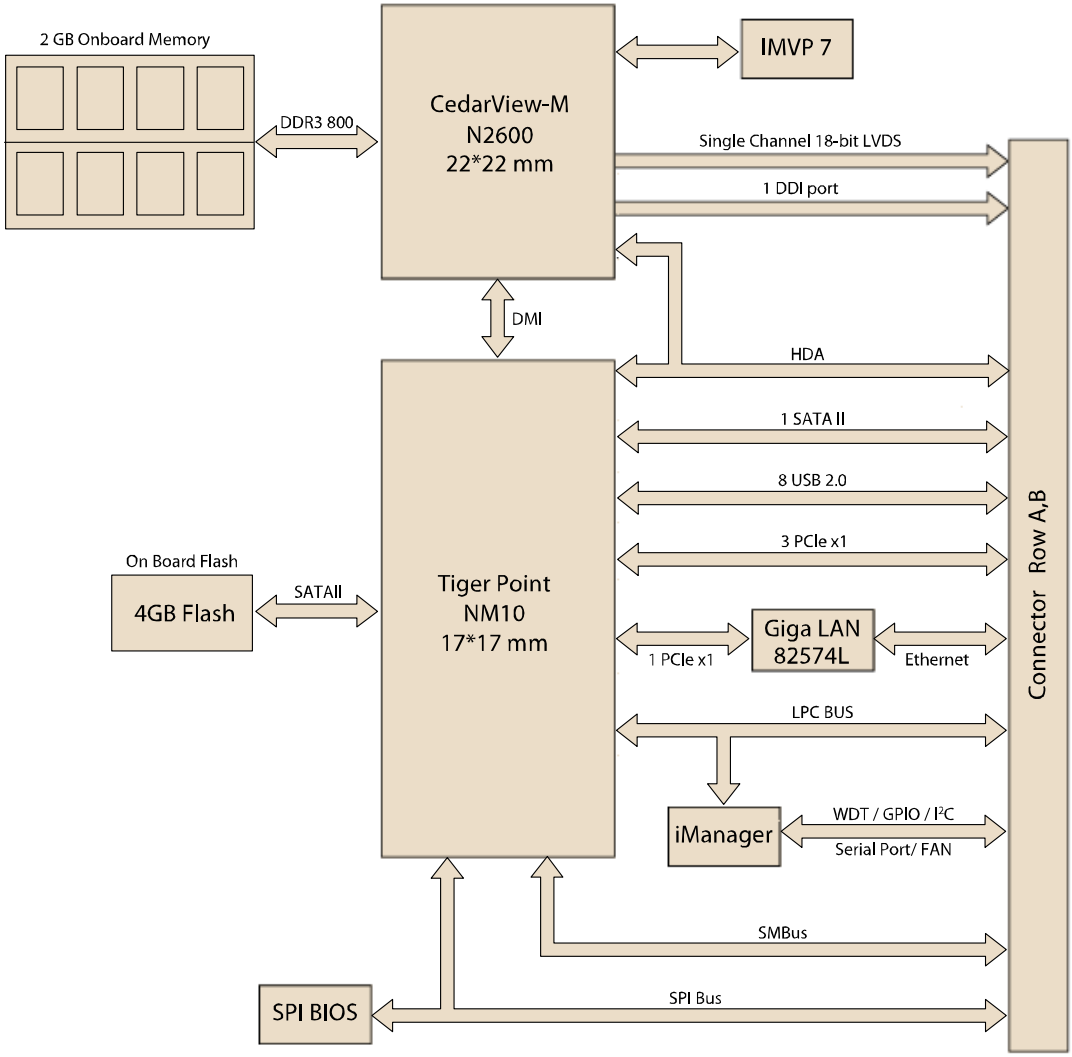



**Figure 1.1 Functional Block Diagram**

## 1.4 SOM-7565 Type 10 Pin Assignment

This section gives SOM-7565 pin assignment on COM Express connector which compliant with COMR.0 R2.0 Type 10 pin-out definitions. More details about how to use these pins and get design reference, please contact to Advantech for design guide, checklist, reference schematic, and other hardware/software supports.

| Row A | | Row B | |
|---|---|---|---|
| A1 | GND (FIXED) | B1 | GND (FIXED) |
| A2 | GBE0_MDI3- | B2 | GBE0_ACT# |
| A3 | GBE0_MDI3+ | B3 | LPC_FRAME# |
| A4 | GBE0_LINK100# | B4 | LPC_AD0 |
| A5 | GBE0_LINK1000# | B5 | LPC_AD1 |
| A6 | GBE0_MDI2- | B6 | LPC_AD2 |
| A7 | GBE0_MDI2+ | B7 | LPC_AD3 |
| A8 | GBE0_LINK# | B8 | LPC_DRQ0# |
| A9 | GBE0_MDI1- | B9 | LPC_DRQ1# |

| | | | |
|---|---|---|---|
| A10 | GBE0_MDI1+ | B10 | LPC_CLK |
| A11 | GND (FIXED) | B11 | GND (FIXED) |
| A12 | GBE0_MDI0- | B12 | PWRBTN# |
| A13 | GBE0_MDI0+ | B13 | SMB_CK |
| A14 | GBE0_CTREF | B14 | SMB_DAT |
| A15 | SUS_S3# | B15 | SMB_ALERT# |
| A16 | SATA0_TX+ | B16 | SATA1_TX+ (Optional) |
| A17 | SATA0_TX- | B17 | SATA1_TX- (Optional) |
| A18 | SUS_S4# | B18 | SUS_STAT# |
| A19 | SATA0_RX+ | B19 | SATA1_RX+ (Optional) |
| A20 | SATA0_RX- | B20 | SATA1_RX- (Optional) |
| A21 | GND (FIXED) | B21 | GND (FIXED) |
| A22 | RSVD | B22 | RSVD |
| A23 | RSVD | B23 | RSVD |
| A24 | SUS_S5# | B24 | PWR_OK |
| A25 | RSVD | B25 | RSVD |
| A26 | RSVD | B26 | RSVD |
| A27 | BATLOW# | B27 | WDT |
| A28 | SATA_ACT# | B28 | N/A |
| A29 | HDA_SYNC | B29 | HDA_SDIN1 |
| A30 | HDA_RST# | B30 | HDA_SDIN0 |
| A31 | GND (FIXED) | B31 | GND (FIXED) |
| A32 | HDA_BITCLK | B32 | SPKR |
| A33 | HDA_SDOUT | B33 | I2C_CK |
| A34 | BIOS_DIS0# | B34 | I2C_DAT |
| A35 | THRMTRIP# | B35 | THRM# |
| A36 | USB6- | B36 | USB7- |
| A37 | USB6+ | B37 | USB7+ |
| A38 | USB_6_7_OC# | B38 | USB_4_5_OC# |
| A39 | USB4- | B39 | USB5- |
| A40 | USB4+ | B40 | USB5+ |
| A41 | GND (FIXED) | B41 | GND (FIXED) |
| A42 | USB2- | B42 | USB3- |
| A43 | USB2+ | B43 | USB3+ |
| A44 | USB_2_3_OC# | B44 | USB_0_1_OC# |
| A45 | USB0- | B45 | USB1- |
| A46 | USB0+ | B46 | USB1+ |
| A47 | VCC_RTC | B47 | EXCD1_PERST# |
| A48 | EXCD0_PERST# | B48 | EXCD1_CPPE# |
| A49 | EXCD0_CPPE# | B49 | SYS_RESET# |
| A50 | LPC_SERIRQ | B50 | CB_RESET# |
| A51 | GND (FIXED) | B51 | GND (FIXED) |
| A52 | RSVD | B52 | RSVD |
| A53 | RSVD | B53 | RSVD |
| A54 | GPI0 | B54 | GPO1 |
| A55 | RSVD | B55 | RSVD |
| A56 | RSVD | B56 | RSVD |
| A57 | GND | B57 | GPO2 |

| | | | |
|---|---|---|---|
| A58 | PCIE_TX3+ | B58 | PCIE_RX3+ |
| A59 | PCIE_TX3- | B59 | PCIE_RX3- |
| A60 | GND (FIXED) | B60 | GND (FIXED) |
| A61 | PCIE_TX2+ | B61 | PCIE_RX2+ |
| A62 | PCIE_TX2- | B62 | PCIE_RX2- |
| A63 | GPI1 | B63 | GPO3 |
| A64 | PCIE_TX1+ | B64 | PCIE_RX1+ |
| A65 | PCIE_TX1- | B65 | PCIE_RX1- |
| A66 | GND | B66 | WAKE0# |
| A67 | GPI2 | B67 | WAKE1# |
| A68 | PCIE_TX0+ | B68 | PCIE_RX0+ |
| A69 | PCIE_TX0- | B69 | PCIE_RX0- |
| A70 | GND (FIXED) | B70 | GND (FIXED) |
| A71 | LVDS_A0+ | B71 | DDI0_PAIR0+ |
| A72 | LVDS_A0- | B72 | DDI0_PAIR0- |
| A73 | LVDS_A1+ | B73 | DDI0_PAIR1+ |
| A74 | LVDS_A1- | B74 | DDI0_PAIR1- |
| A75 | LVDS_A2+ | B75 | DDI0_PAIR2+ |
| A76 | LVDS_A2- | B76 | DDI0_PAIR2- |
| A77 | LVDS_VDD_EN | B77 | N/A |
| A78 | LVDS_A3+ | B78 | N/A |
| A79 | LVDS_A3- | B79 | LVDS_BKLT_EN |
| A80 | GND (FIXED) | B80 | GND (FIXED) |
| A81 | LVDS_A_CK+ | B81 | DDI0_PAIR3+ |
| A82 | LVDS_A_CK- | B82 | DDI0_PAIR3- |
| A83 | LVDS_I2C_CK | B83 | LVDS_BKLT_CTRL |
| A84 | LVDS_I2C_DAT | B84 | VCC_5V_SBY |
| A85 | GPI3 | B85 | VCC_5V_SBY |
| A86 | RSVD | B86 | VCC_5V_SBY |
| A87 | RSVD | B87 | VCC_5V_SBY |
| A88 | PCIE0_CK_REF+ | B88 | BIOS_DIS1# |
| A89 | PCIE0_CK_REF- | B89 | DD0_HPD |
| A90 | GND (FIXED) | B90 | |
| A91 | SPI_POWER | B91 | N/A |
| A92 | SPI_MISO | B92 | N/A |
| A93 | GPO0 | B93 | N/A |
| A94 | SPI_CLK | B94 | N/A |
| A95 | SPI_MOSI | B95 | DDI0_DDC_AUX_SEL |
| A96 | N/A | B96 | RSVD |
| A97 | TYPE10# | B97 | SPI_CS# |
| A98 | RS1_TX | B98 | DDI0_CTRLCLK_AUX+ |
| A99 | RS1_RX | B99 | DDI0_CTRLDATA_AUX- |
| A100 | GND (FIXED) | B100 | |
| A101 | RS2_TX | B101 | FAN_PWMOUT |
| A102 | RS2_RX | B102 | FAN_TACHIN |
| A103 | LID# | B103 | SLEEP# |
| A104 | VCC_12V | B104 | VCC_12V |
| A105 | VCC_12V | B105 | VCC_12V |

| | | | |
|---|---|---|---|
| A106 | VCC_12V | B106 | VCC_12V |
| A107 | VCC_12V | B107 | VCC_12V |
| A108 | VCC_12V | B108 | VCC_12V |
| A109 | VCC_12V | B109 | VCC_12V |
| A110 | GND (FIXED) | B110 | GND (FIXED) |

# Chapter 2

## Mechanical Information

This chapter gives mechanical information on the SOM-7565 CPU Computer on Module

Sections include:

- Board Information
- Mechanical Drawing

## 2.1 Board Information

The figures below indicate the main chips on SOM-7565 Computer-on-Module. Please aware of these positions when designing the customer's own carrier board to avoid mechanical and thermal problems.

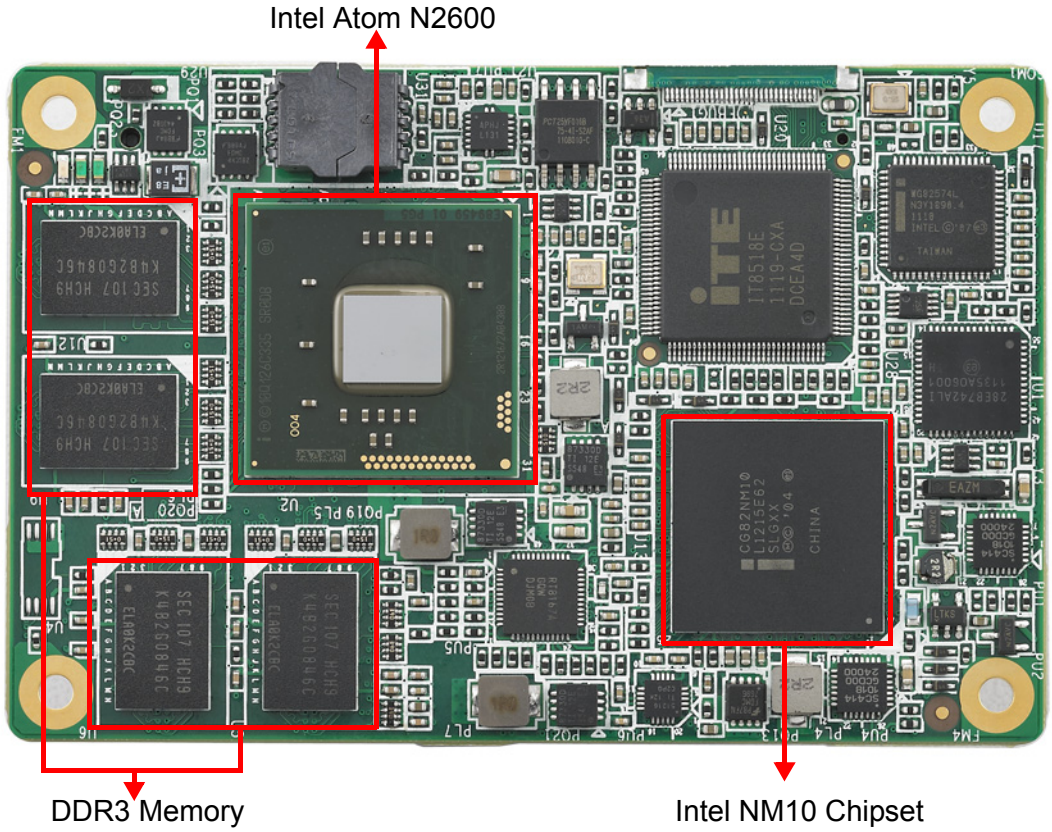



**Figure 2.1 Board chips identify - Front**

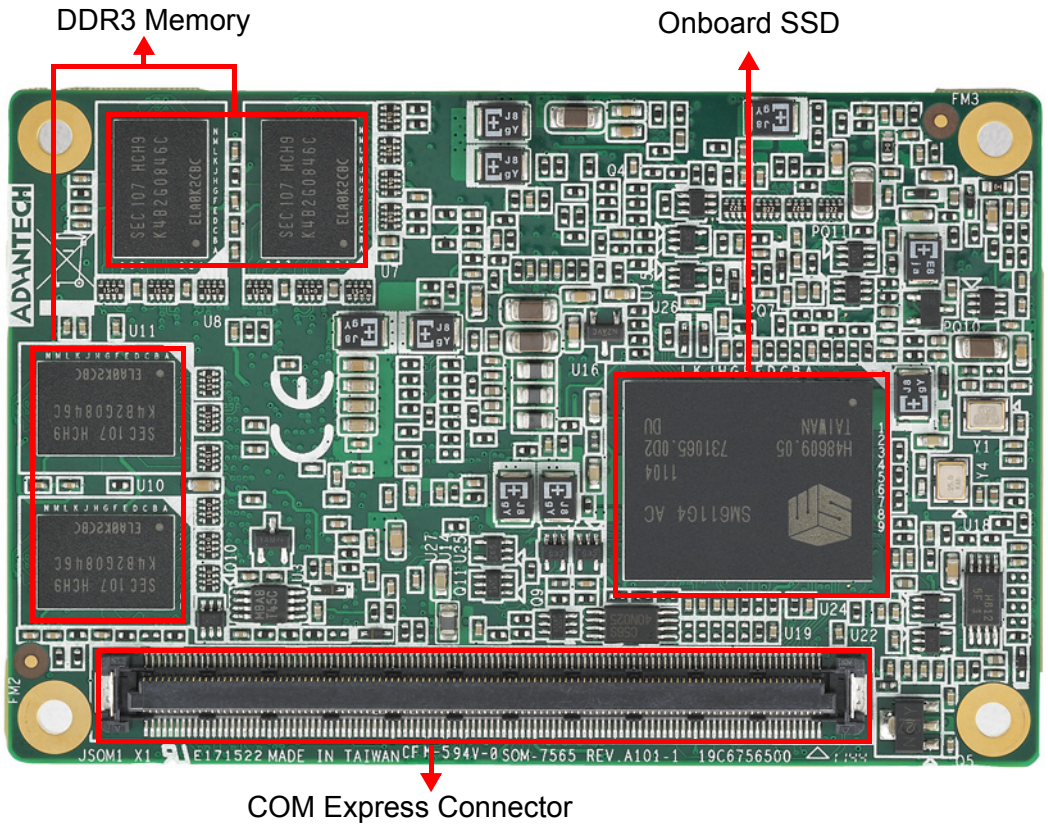



**Figure 2.2 Board chips identify - Back**

## 2.2 Mechanical Drawing

For more detail about 2D/3D models, please find on Advantech COM support service website http://com.advantech.com.

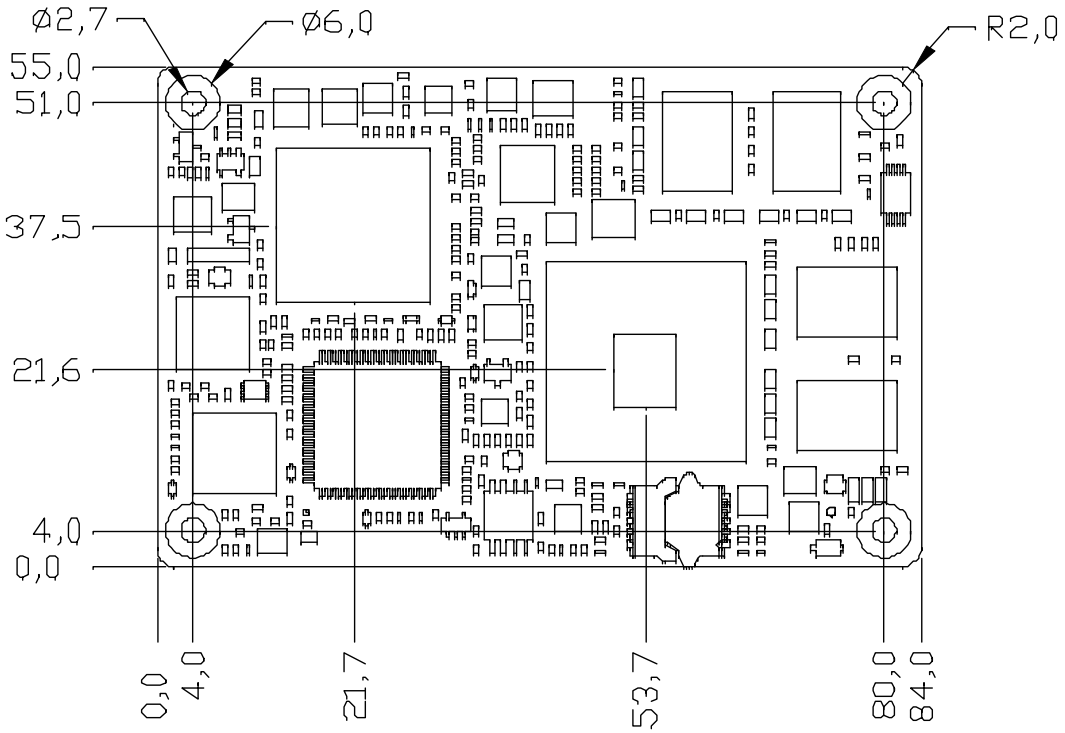



**Figure 2.3 Board Mechanical Drawing - Front**

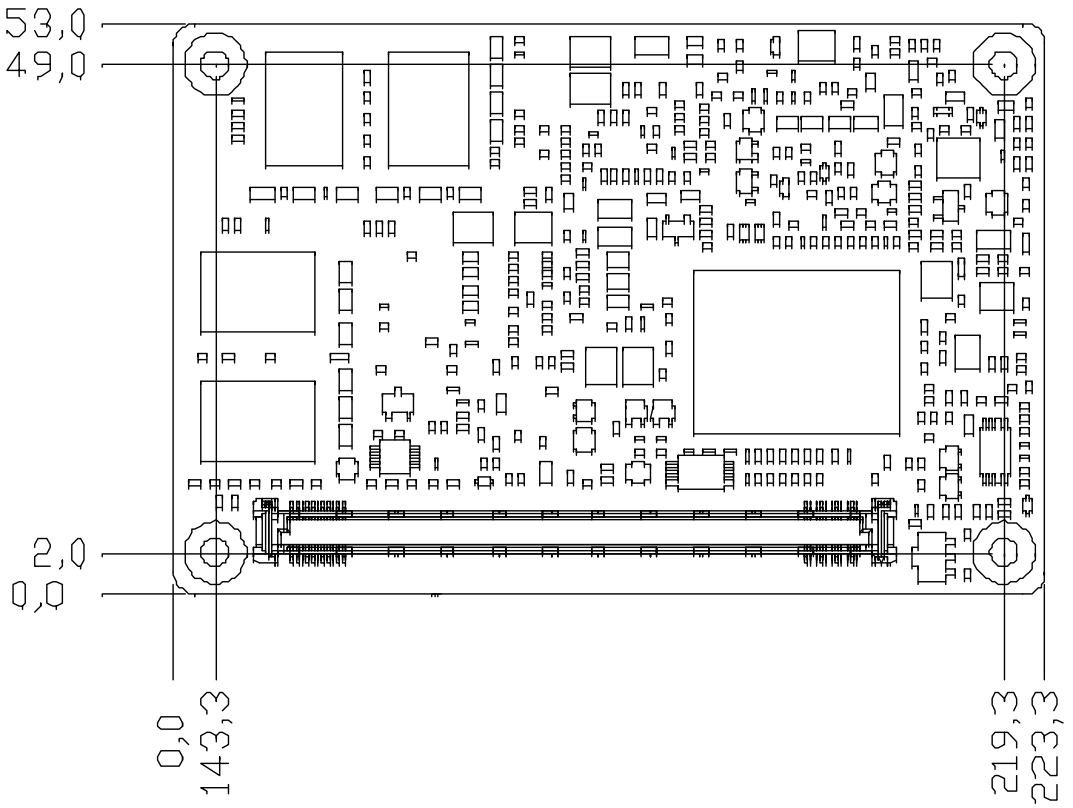



**Figure 2.4 Board Mechanical Drawing - Back**

# Chapter 3

## BIOS

Sections include:

- Entering Setup
- Main Setup
- Advanced BIOS Features Setup
- Chipset
- Boot Settings
- Security Setup
- Save & Exit

AMIBIOS has been integrated into many motherboards for over a decade. With the AMIBIOS Setup program, users can modify BIOS settings and control various system features. This chapter describes the basic navigation of the SOM-7565 BIOS setup screens.

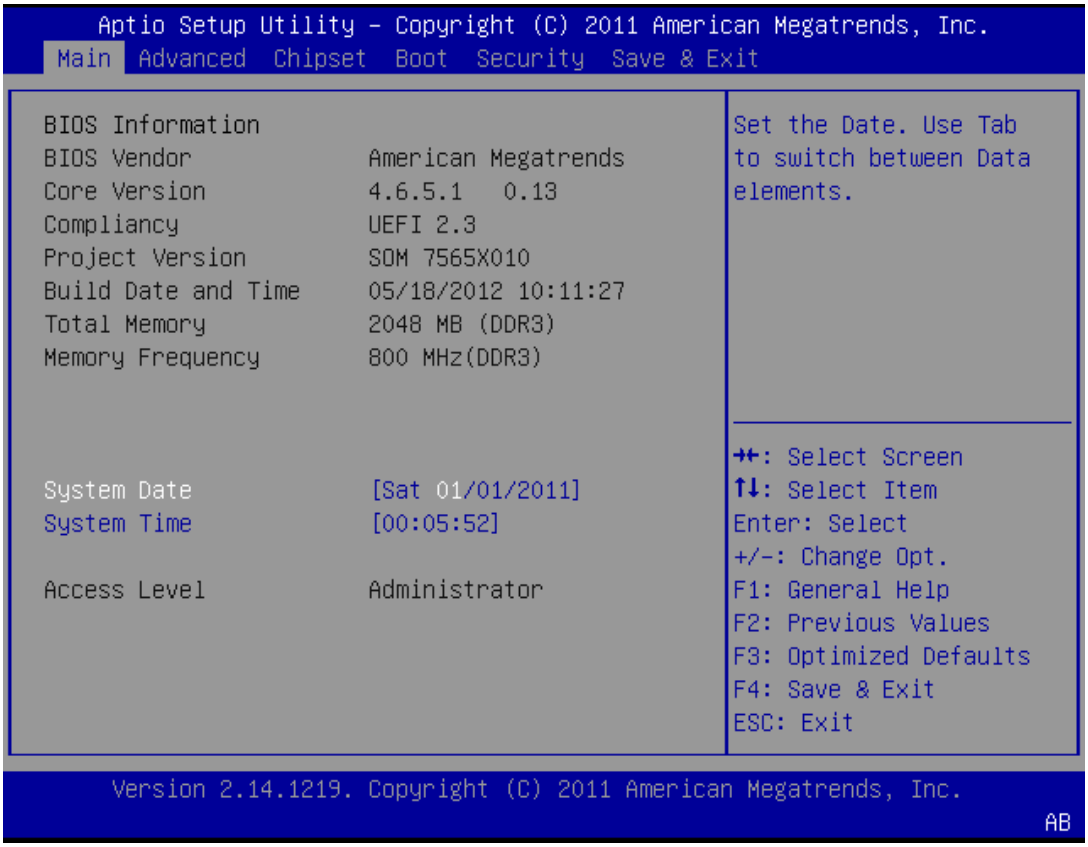

Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
BIOS Information
BIOS Vendor American Megatrends
Core Version 4.6.5.1 0.13
Compliancy UEFI 2.3
Project Version SOM 7565X010
Build Date and Time 05/18/2012 10:11:27
Total Memory 2048 MB (DDR3)
Memory Frequency 800 MHz(DDR3)
System Date [Sat 01/01/2011]
System Time [00:05:52]
Access Level Administrator
Set the Date. Use Tab to switch between Data elements.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
AB

**Figure 3.1 Setup program initial screen**

AMI's BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This information is stored in flash ROM so it retains the Setup information when the power is turned off.

## 3.1 Entering Setup

Turn on the computer and then press <F2> or <DEL> to enter Setup menu.

## 3.2 Main Setup

When users first enter the BIOS Setup Utility, users will enter the Main setup screen. Users can always return to the Main setup screen by selecting the Main tab. There are two Main Setup options. They are described in this section. The Main BIOS Setup screen is shown below.

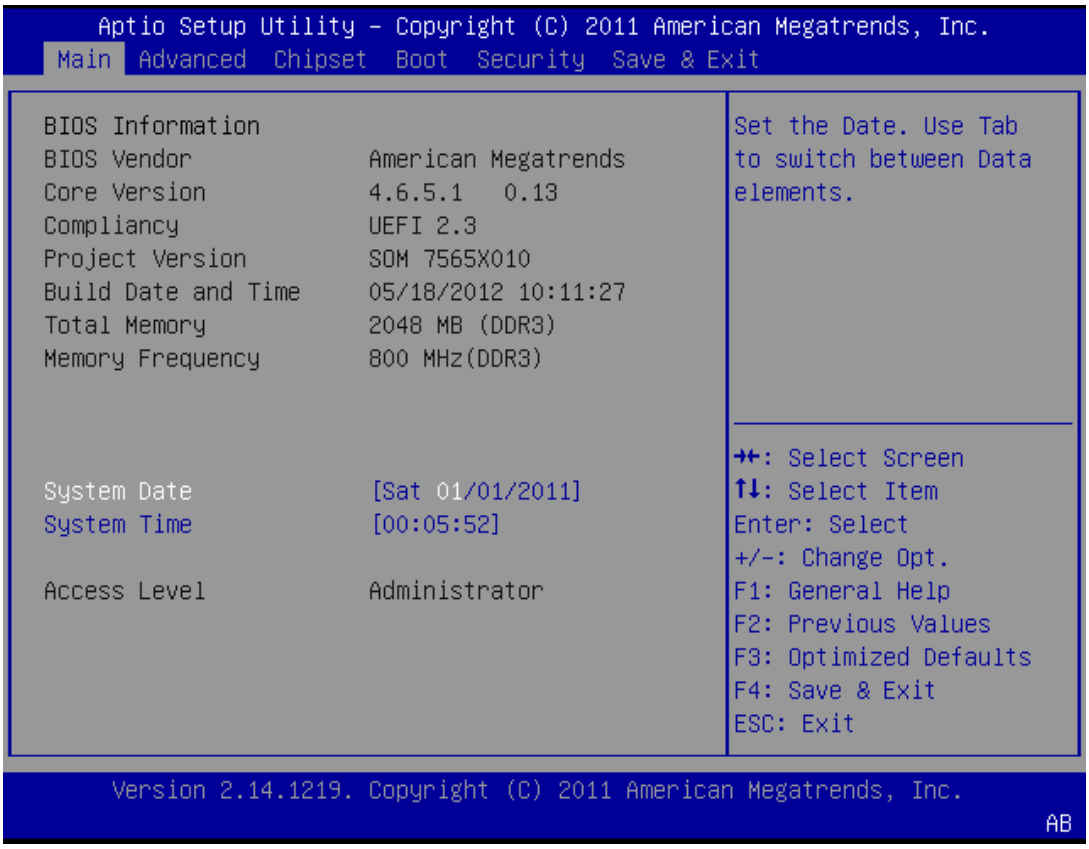

Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
BIOS Information
BIOS Vendor American Megatrends
Core Version 4.6.5.1 0.13
Compliancy UEFI 2.3
Project Version SOM 7565X010
Build Date and Time 05/18/2012 10:11:27
Total Memory 2048 MB (DDR3)
Memory Frequency 800 MHz(DDR3)
System Date [Sat 01/01/2011]
System Time [00:05:52]
Access Level Administrator
Set the Date. Use Tab to switch between Data elements.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
AB

**Figure 3.2 Main setup screen**

The Main BIOS setup screen has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured; options in blue can. The right frame displays the key legend.

Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it.

### 3.2.1 System time / System date

Use this option to change the system time and date. Highlight System Time or System Date using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time must be entered in HH:MM:SS format.

## 3.3 Advanced BIOS Features Setup

Select the Advanced tab from the SOM-7565 setup screen to enter the Advanced BIOS Setup screen. Users can select any item in the left frame of the screen, such as CPU Configuration, to go to the sub menu for that item. Users can display an Advanced BIOS Setup option by highlighting it using the <Arrow> keys. All Advanced BIOS Setup options are described in this section. The Advanced BIOS Setup screens are shown below. The sub menus are described on the following pages.

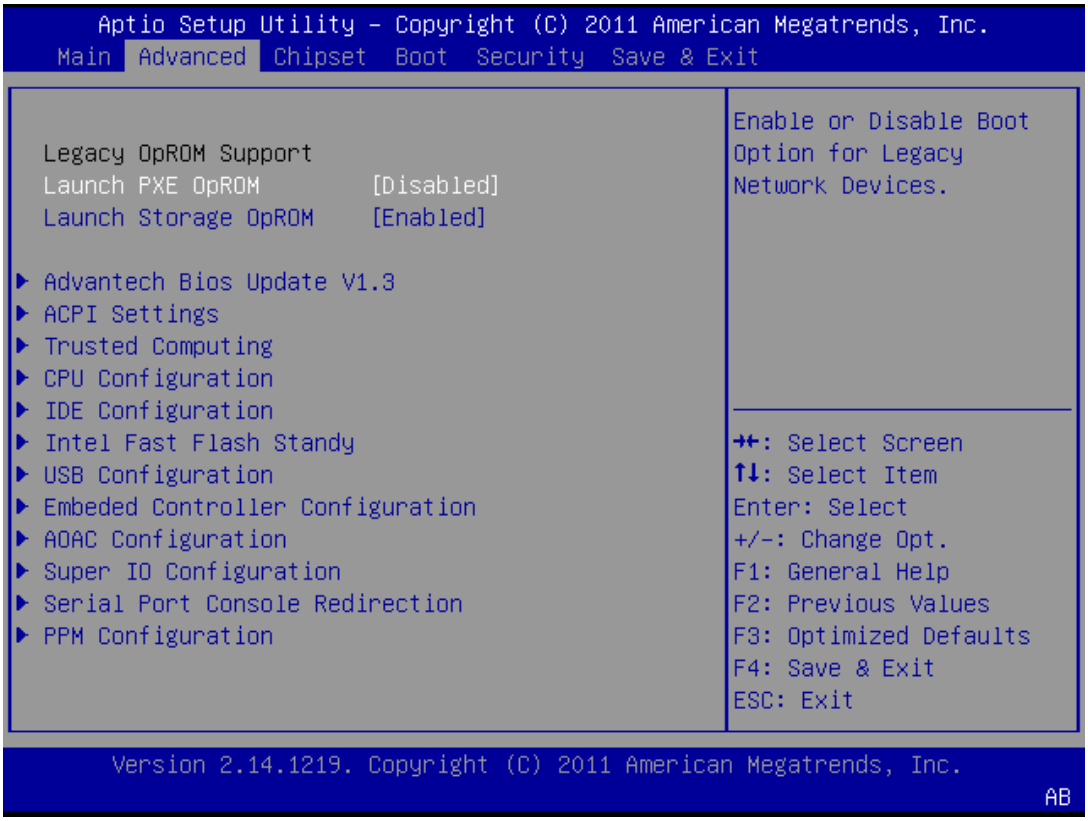



**Figure 3.3 Advanced BIOS features setup screen**

**Launch PXE OpROM**

This item allows users to enable or disable launch PXE OpROM if available.

**Launch Storage OpROM**

This item allows users to enable or disable launch storage OpROM if available.

### 3.3.1 Advantech BIOS Update V1.3

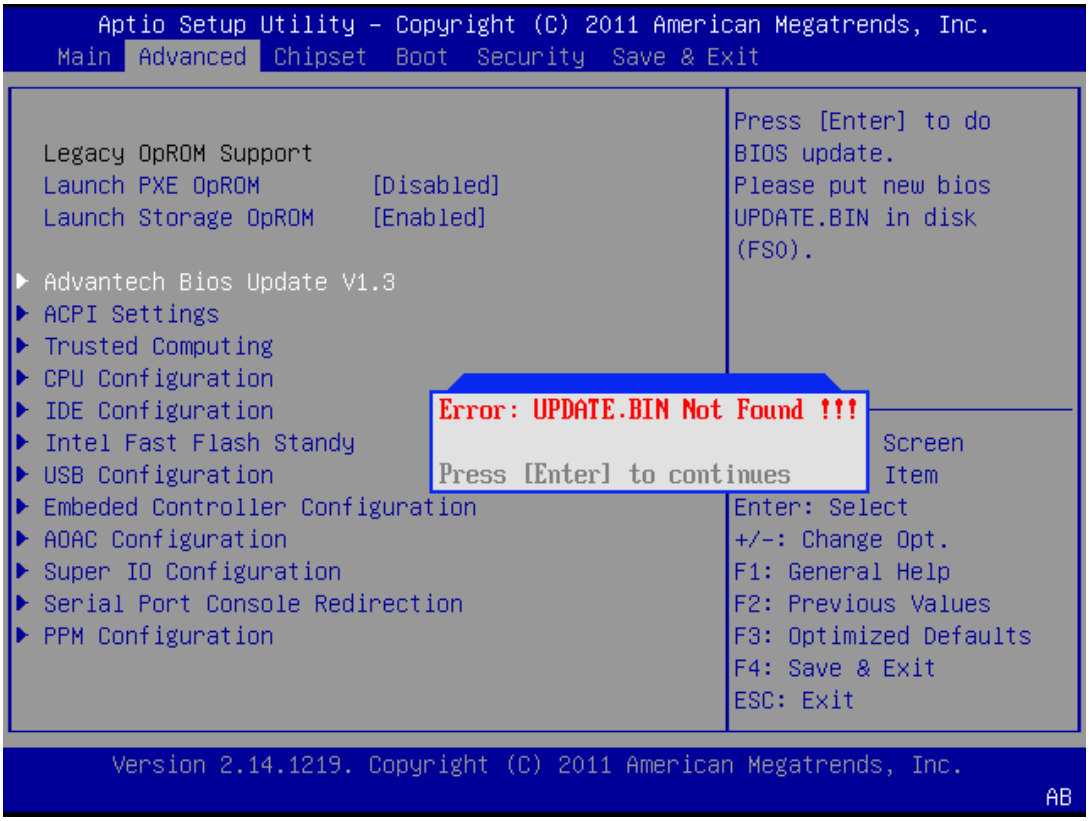



**Figure 3.4 Advantech BIOS Update V1.3**

**Advantech BIOS Update V1.3**

Press[Enter] to do BIOS update.

Please put new BIOS UPDATE.BIN in disk(FS0).

### 3.3.2 ACPI Settings

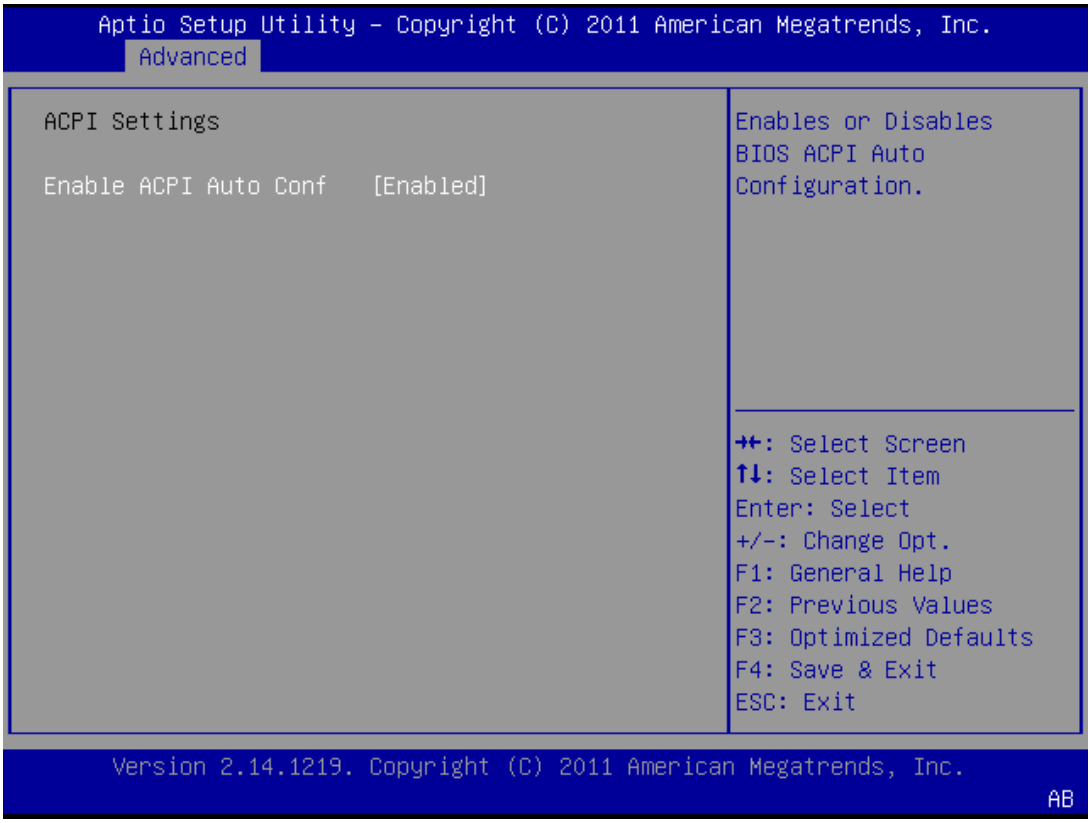



**Figure 3.5 ACPI Setting**

**Enable ACPI Auto Configuration**

This item allows users to enable or disable BIOS ACPI auto configuration.

### 3.3.3 Trusted Configuration

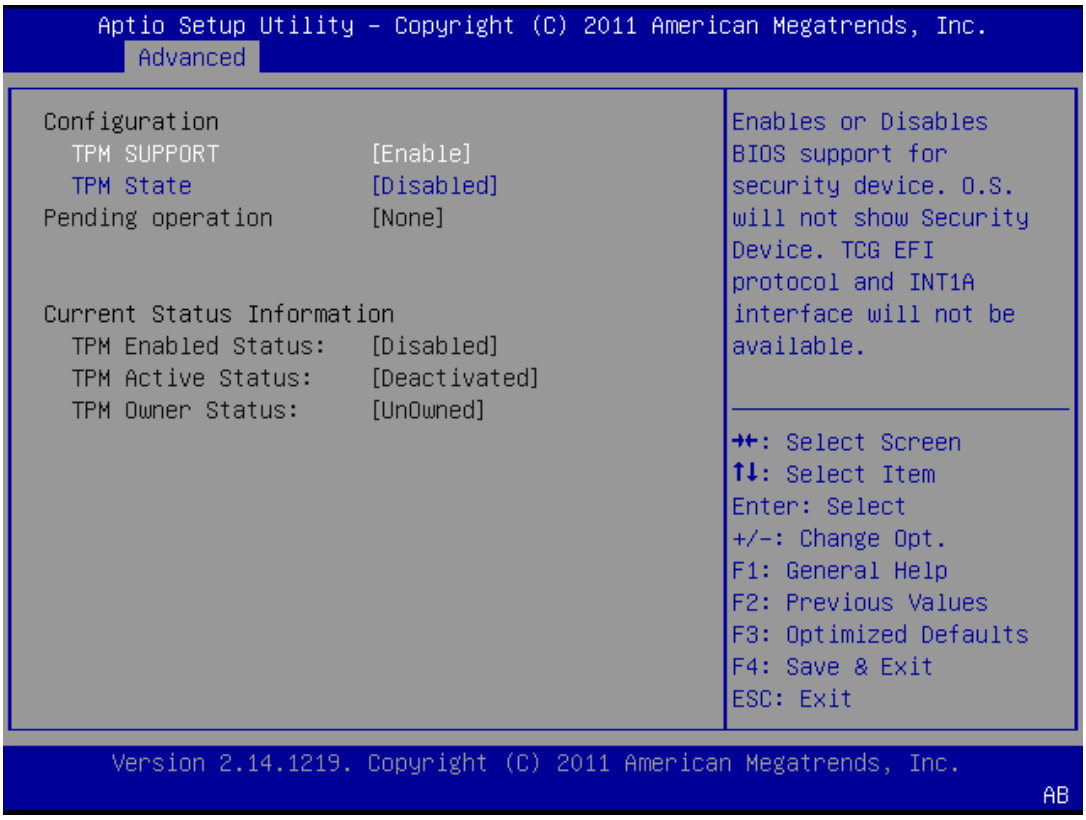

Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Advanced
Configuration
TPM SUPPORT [Enable]
TPM State [Disabled]
Pending operation [None]
Current Status Information
TPM Enabled Status: [Disabled]
TPM Active Status: [Deactivated]
TPM Owner Status: [UnOwned]
Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
AB

**Figure 3.6 TPM Configuration**

**TPM Support**

Disable/Enable TPM if available.

**TPM State**

This item is for TPM state selecting.

### 3.3.4 CPU Configuration

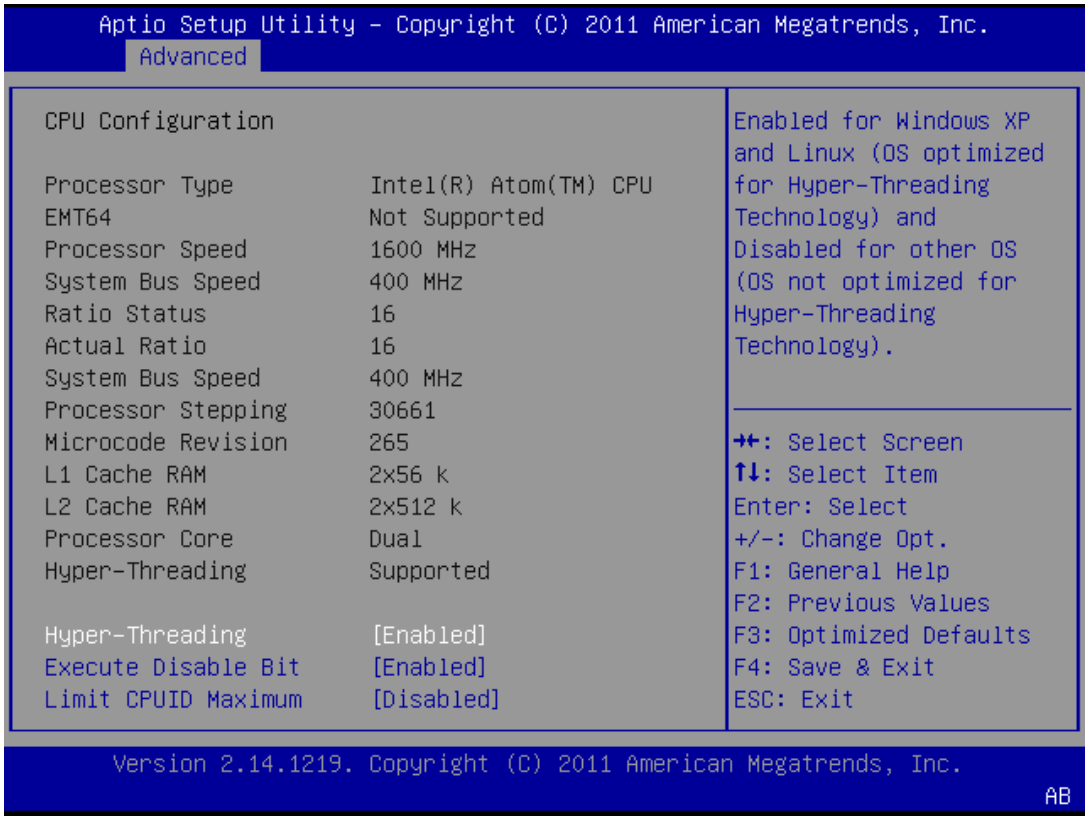

Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Advanced
CPU Configuration
Processor Type Intel(R) Atom(TM) CPU
EMT64 Not Supported
Processor Speed 1600 MHz
System Bus Speed 400 MHz
Ratio Status 16
Actual Ratio 16
System Bus Speed 400 MHz
Processor Stepping 30661
Microcode Revision 265
L1 Cache RAM 2x56 k
L2 Cache RAM 2x512 k
Processor Core Dual
Hyper-Threading Supported
Hyper-Threading [Enabled]
Execute Disable Bit [Enabled]
Limit CPUID Maximum [Disabled]
Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading Technology).
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
AB

**Figure 3.7 CPU Configuration**

**Hyper Threading Technology**

This item allows users to enable or disable Intel® Hyper Threading technology.

**Execute Disable Bit**

This item allows users to enable or disable the No-Execution page protection technology.

**Limit CPUID Maximum**

This item allows users to limit the maximum value of CPUID.

### 3.3.5 SATA Configuration

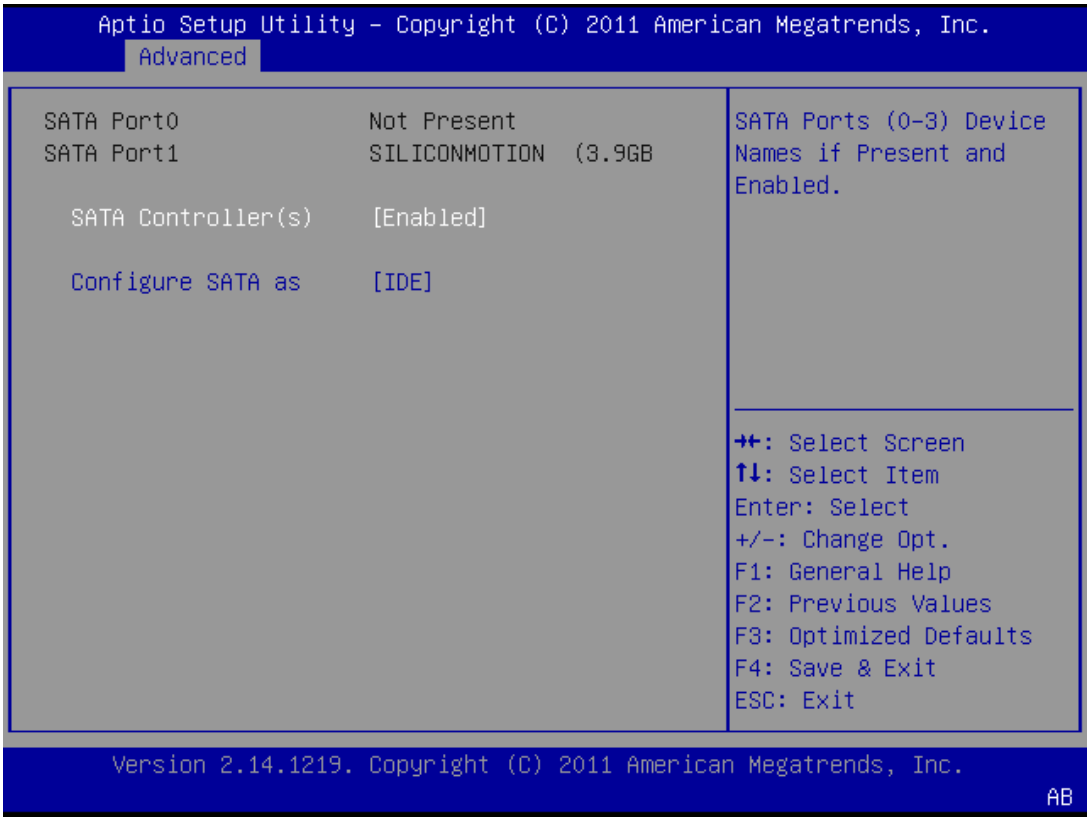



**Figure 3.8 SATA Configuration**

**SATA Controller(s)**

This item allows users to enable or disable the SATA controller(s).

**Configure SATA as**

This item allows users to select mode of SATA controller(s).

### 3.3.6 Intel Fast Flash Standy

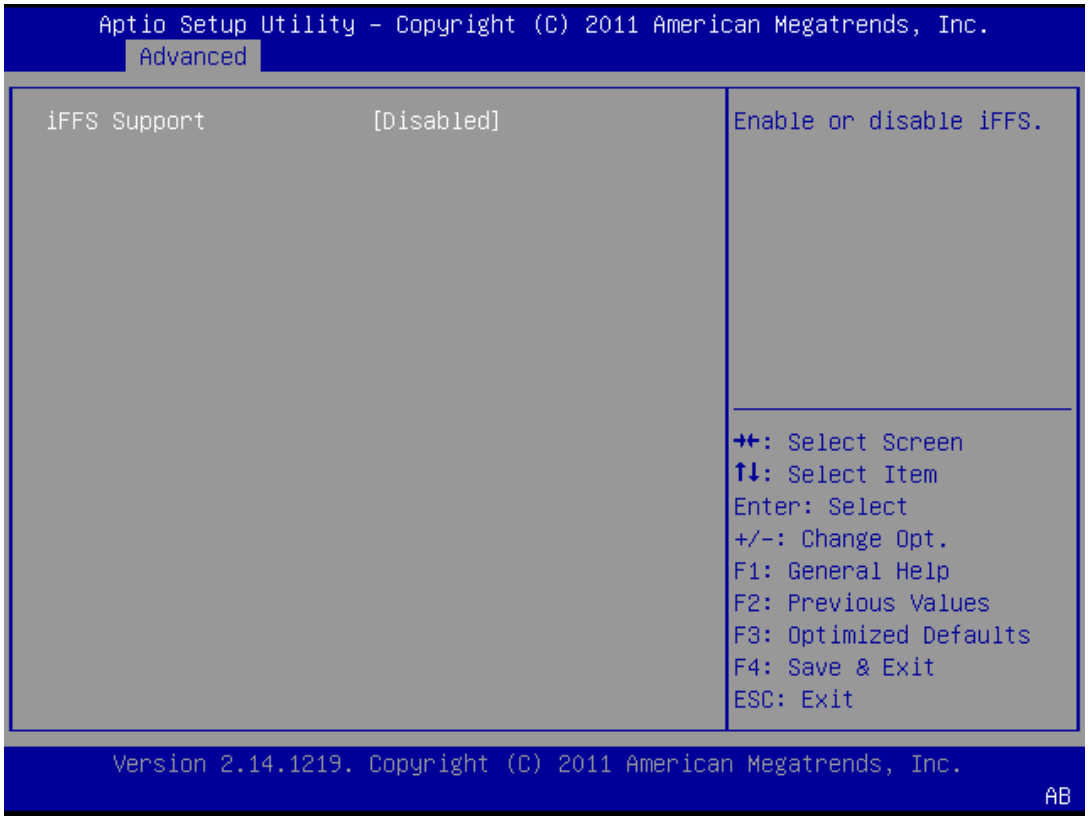



**Figure 3.9 Intel Fast Flash Standy**

**iFFS Support**

Enable or disable IFFS function.

### 3.3.7 USB Configuration

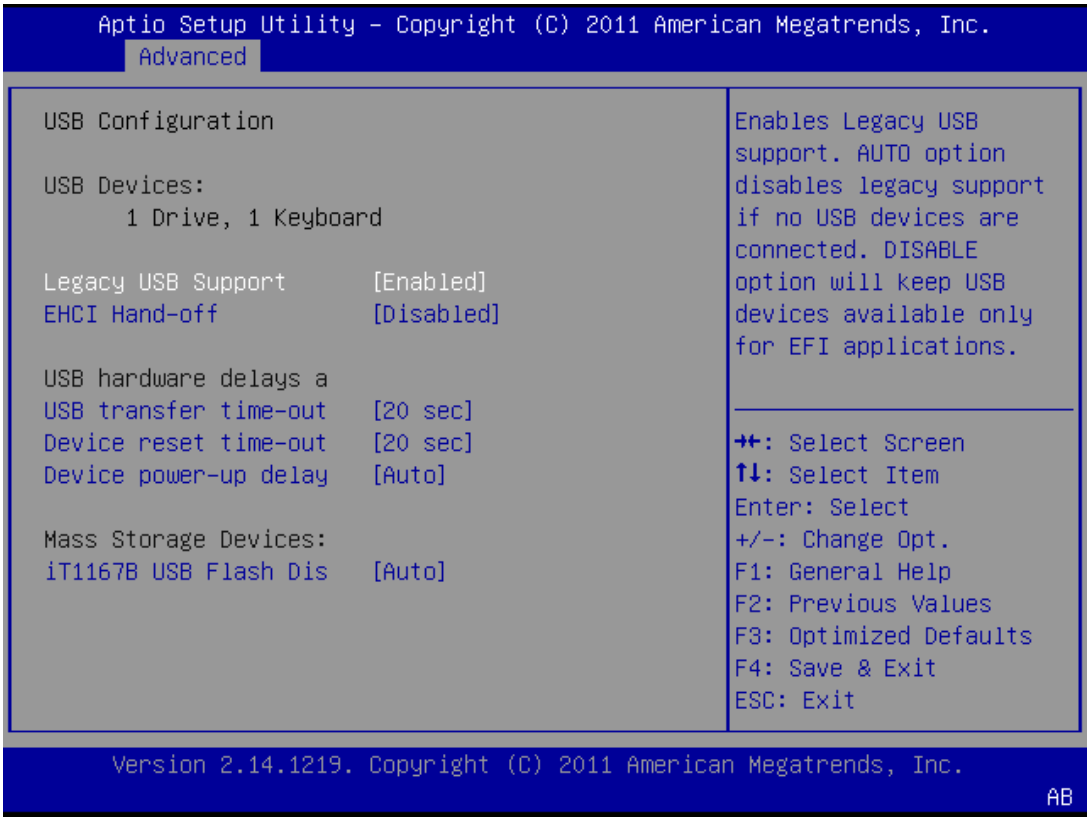

Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Advanced
USB Configuration
USB Devices:
1 Drive, 1 Keyboard
Legacy USB Support [Enabled]
EHCI Hand-off [Disabled]
USB hardware delays a
USB transfer time-out [20 sec]
Device reset time-out [20 sec]
Device power-up delay [Auto]
Mass Storage Devices:
iT1167B USB Flash Dis [Auto]
Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
AB

**Figure 3.10 USB Configuration**

**Legacy USB Support**

Enable the support for legacy USB. Auto option disables legacy support if no USB devices are connected.

**EHCI Hand-Off**

This is a workaround for the OS without EHCI hand-off support. The EHCI ownership change should claim by EHCI driver.

**USB transfer time-out**

Set the time-out value for Control, Bulk, and Interrupt transfers.

**Device reset time-out**

Set USB mass storage device Start Unit command time-out value.

**Device power-up delay**

Set the maximum time of the device will take before it properly reports itself to the Host Controller. 'Auto' uses default value: for a Root port it is 100 ms, for a Hub port the delay is taken from Hub descriptor.

### 3.3.8 Embedded Controller Configuration

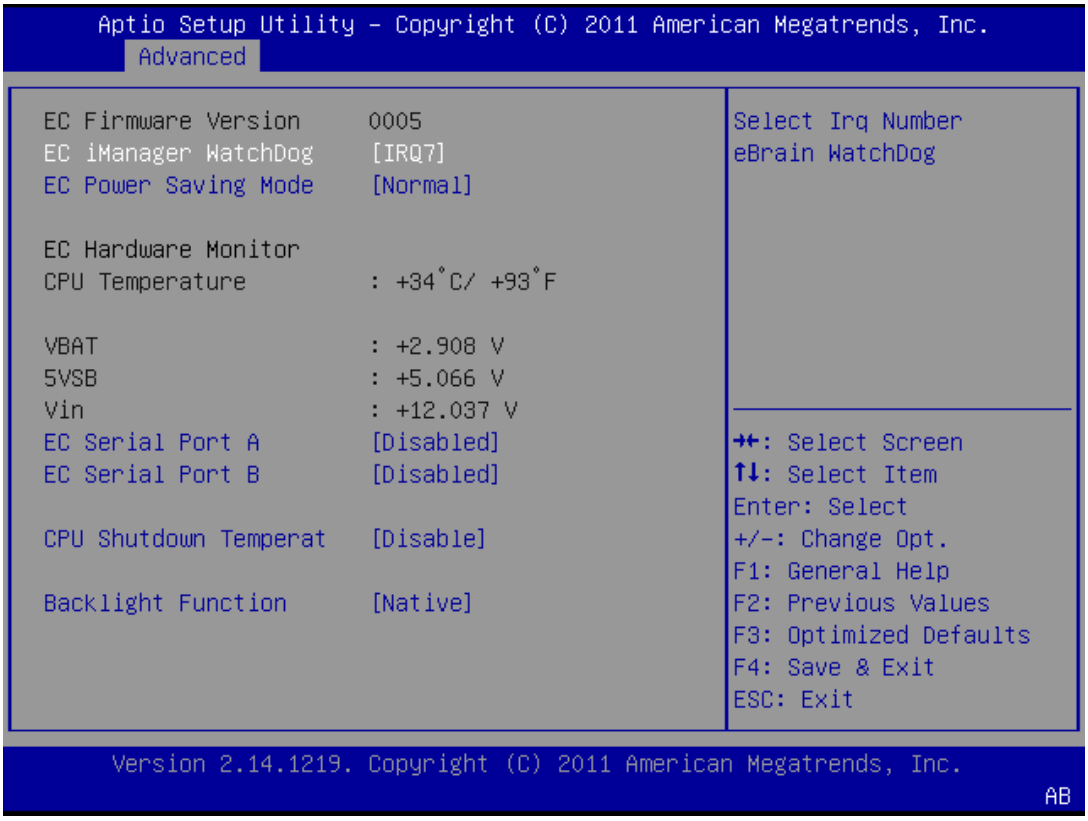



**Figure 3.11 Embedded Controller Configuration**

**EC iManager WatchDog IRQ**

This item allows users to set the IRQ number of EC watchdog.

**EC Power Saving Mode**

This item allows users to set board's power saving mode when off.

**EC Serial Port A**

This item allows to enable or disable an EC output 2-wire serial port A

**EC Serial Port B**

This item allows to enable or disable an EC output 2-wire serial port B

**CPU Shutdown Temperature**

This item allows users to set the value of CPU shutdown temperature.

**Backlight Function**

This item allows users to set backlight enable polarity.

### 3.3.9 AOAC Configuration

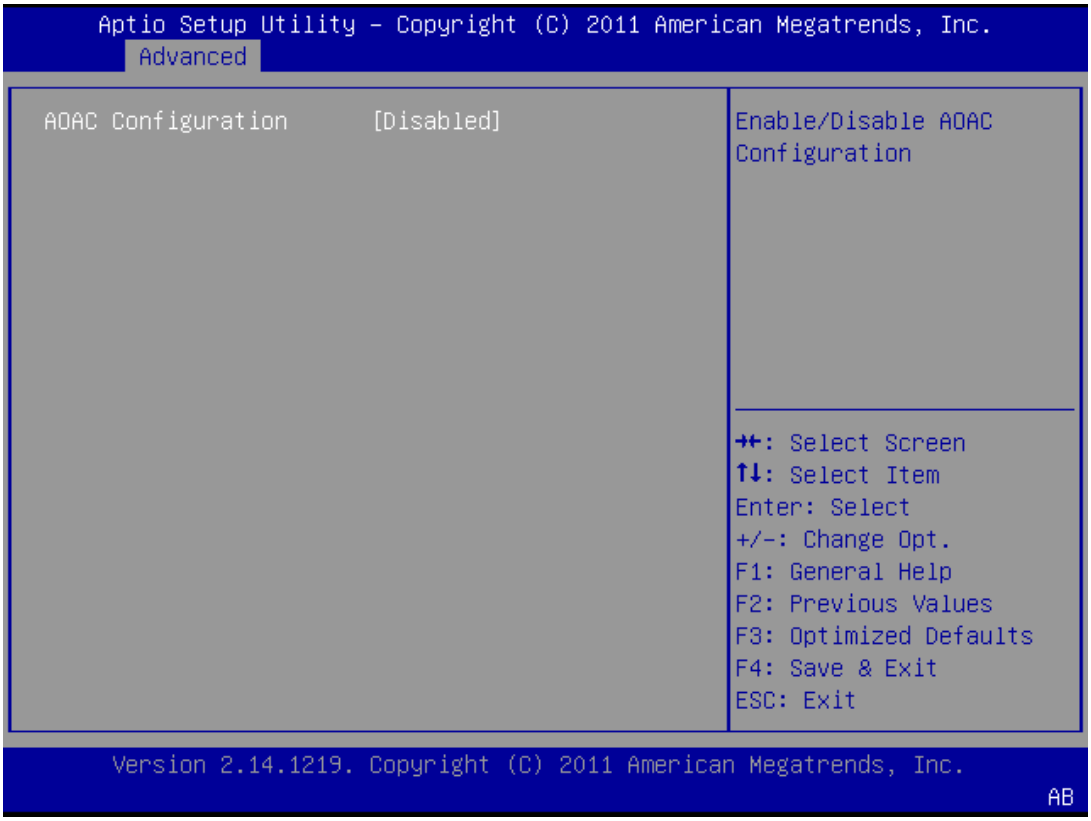



**Figure 3.12 AOAC Configuration**

**AOAC Configuration**

Enable/Disable AOAC Configuration.

## 3.3.10 Super IO Configuration

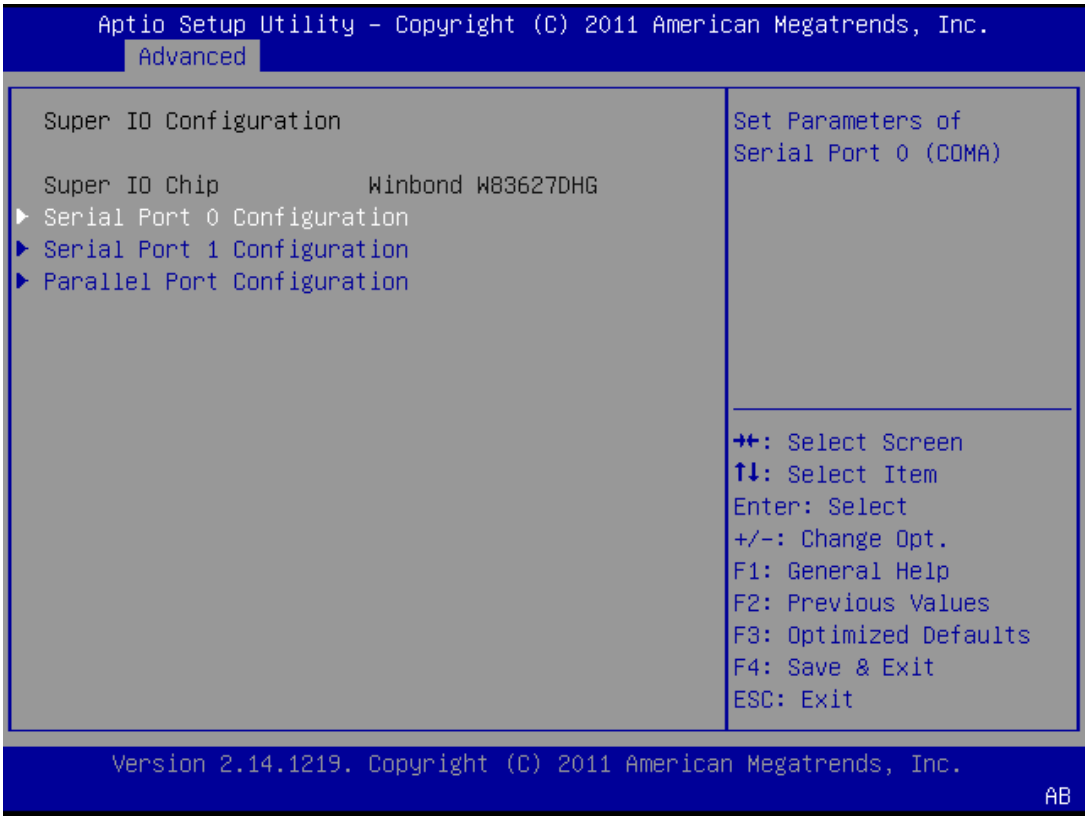



**Figure 3.13 Super IO Configuration**

**Serial Port 0 Configuration**

This item allows users to configure serial port 0.

**Serial Port 1 Configuration**

This item allows users to configure serial port 1.

**Parallel Port Configuration**

This item allows users to configure parallel port.

#### 3.3.10.1 Serial Port 0 Configuration

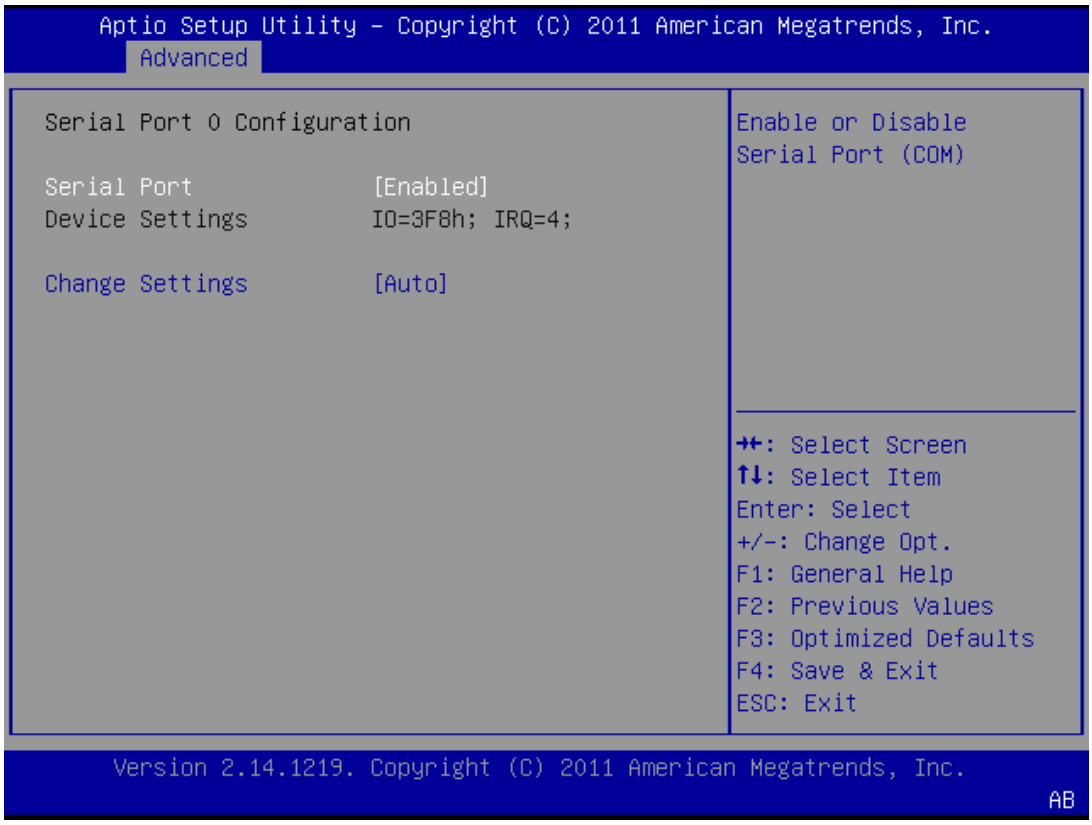



**Figure 3.14 Serial Port 0 Configuration**

**Serial Port**

Serial port 0 enable or disable

**Change settings**

Serial port 0 IRQ/IO/mode resources configuration. Users can choose IRQ,IO, and MODE.

### 3.3.10.2 Serial Port a Configuration

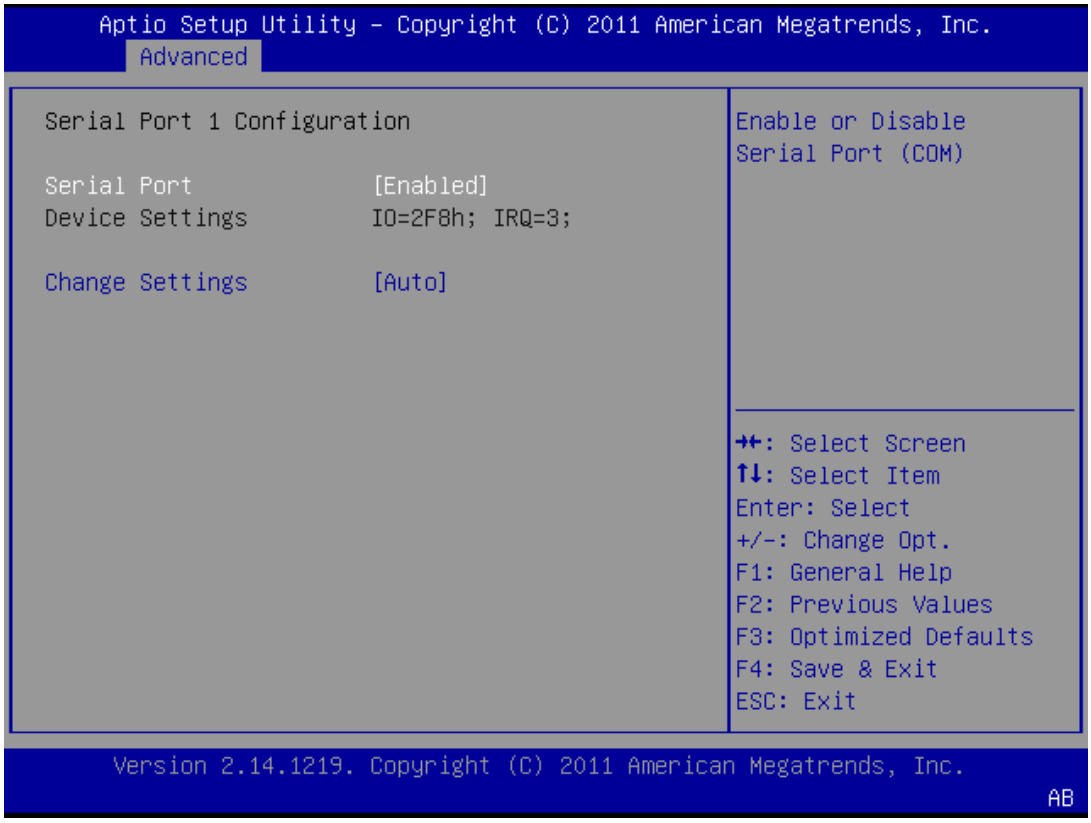



**Figure 3.15 Serial Port a Configration**

**Serial Port**

Serial port 1 enable or disable

**Change settings**

Serial port 1 IRQ/IO/mode resources configuration. Users can choose IRQ,IO, and MODE.

### 3.3.10.3 Parallel Port Configuration

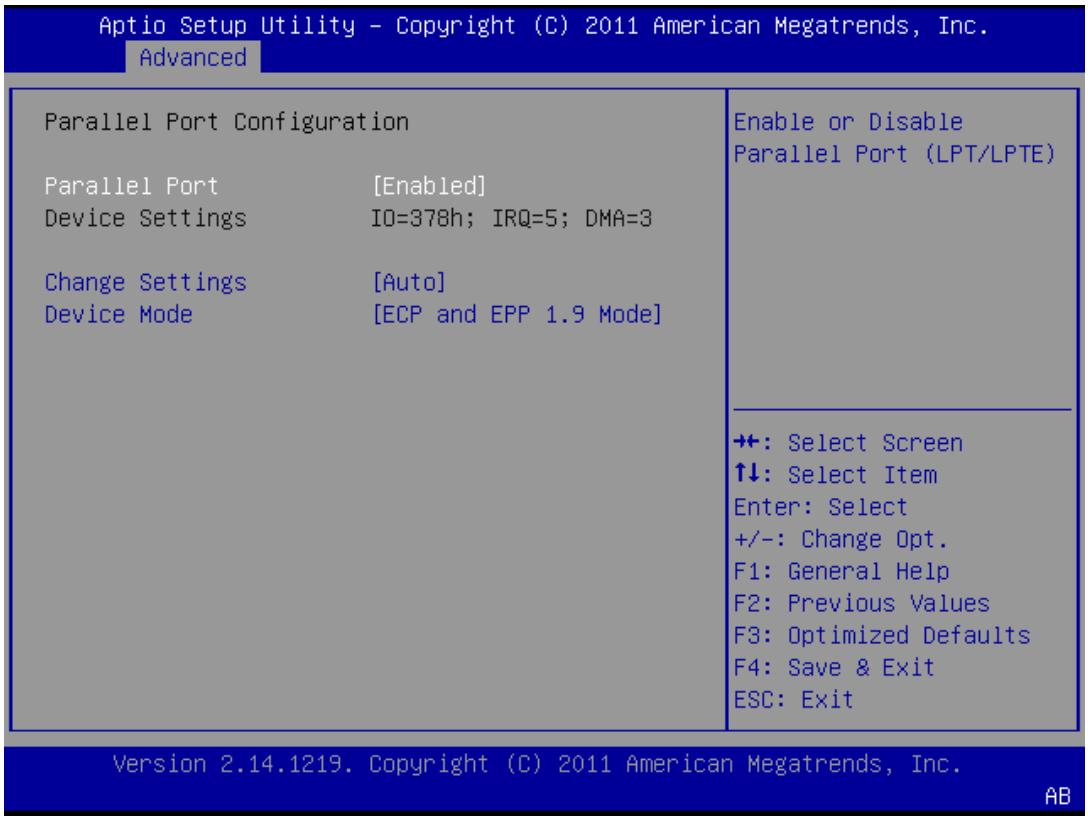



**Figure 3.16 Parallel Port Configuration**

**Parallel Port**

This item allows to enable or disable parallel port.

**Change settings**

This item allow parallel port resources include IRQ/IO configuration.

**Device Mode**

Set parallel mode as EPP/ECP/STD/SPP.

### 3.3.11 Serial Port Console Redirection

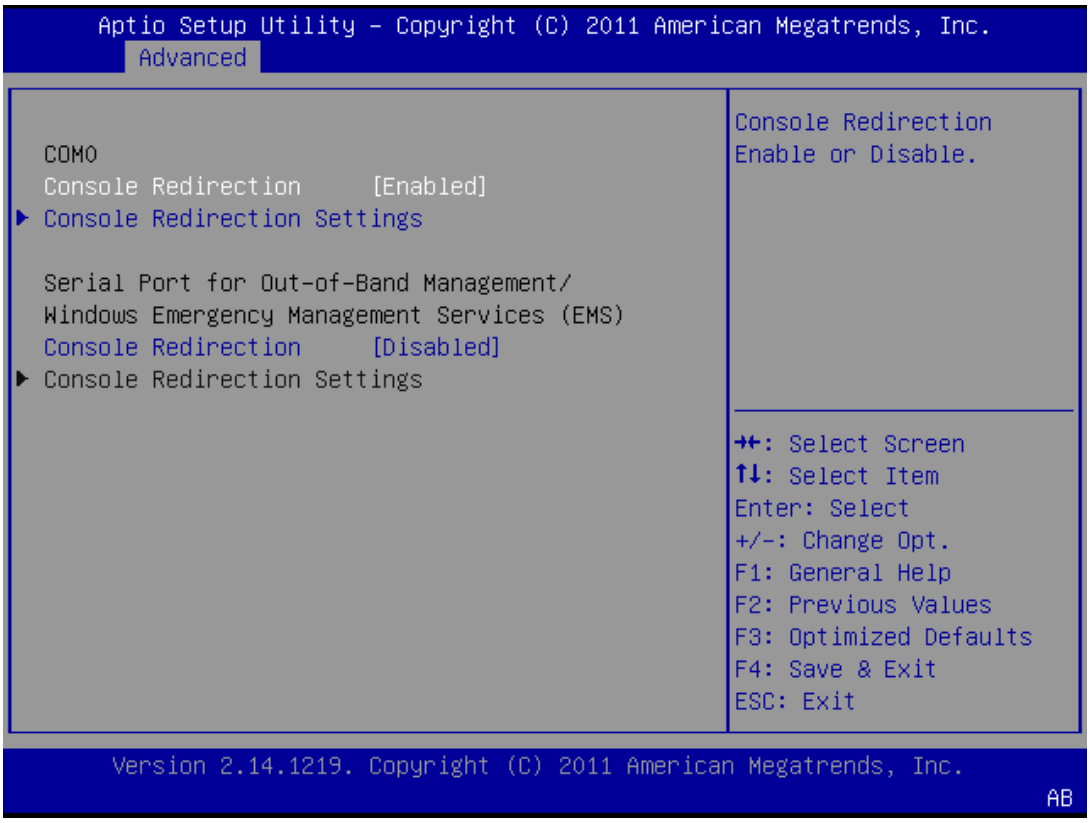



**Figure 3.17 Serial Port Console Redirection**

**Console Redirection(COM0)**

Console Redirection Enable or Disable.

**Console Redirection Settings**

The settings specify how the host computer and the computer and the remote computer(which the user is using) will exchange data. Both computers should have the same or compatible settings.

**Console Redirection(EMS)**

Console Redirection Enable or Disable.

**Console Redirection Settings**

This item allows users to enable or disable console redirection for Microsoft Windows Emergency Management Serivces (EMS).

### 3.3.11.1 Console Redirection Settings

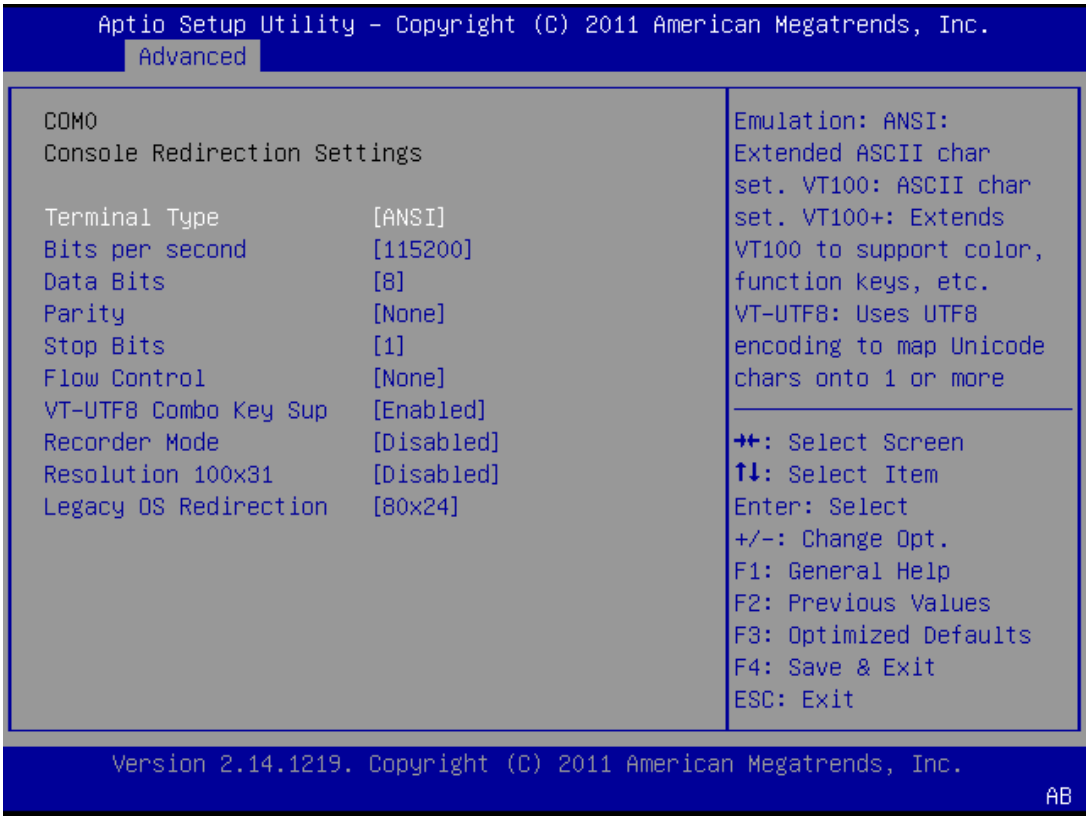

Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Advanced
COM0
Console Redirection Settings
Terminal Type [ANSI]
Bits per second [115200]
Data Bits [8]
Parity [None]
Stop Bits [1]
Flow Control [None]
VT-UTF8 Combo Key Sup [Enabled]
Recorder Mode [Disabled]
Resolution 100x31 [Disabled]
Legacy OS Redirection [80x24]
Emulation: ANSI: Extended ASCII char set. VT100: ASCII char set. VT100+: Extends VT100 to support color, function keys, etc. VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
AB

**Figure 3.18 Console Redirection Settings**

**Terminal Type**

Emulation: ANSI: Extended ASCII char set. VT100: ASCII char set. VT100+: Extends VT100 to support color, function keys, etc. VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.

**Bits per second**

Select the serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.

**Data Bits**

Data Bits 7 or 8

**Parity**

A parity bit can be sent with the data bits to detect some transmission errors. Even: parity bit is 0 if the num of 1's in the data bits is even. Odd: parity bit is 0 if num of 1's in the data bits is odd. Mark: parity bit is always 1. Space: Parity bit is always 0. Mark and Space Parity do not allow for error detection. They can be used as an additional data bit.

**Stop Bits**

Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning). The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit.

**Flow Control**

Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.

**VT-UTF8 Combo Key Support**

Enable VT-UTF8 Combination Key Support for ANSI/VT100 terminals

**Recorder Mode**

With this mode enabled only text will be sent. This is to capture Terminal data.

**Resolution 100x31**

Enables or disables extended terminal resolution

**Legacy OS Redirection**

On Legacy OS, the Number of Rows and Columns supported redirection

### 3.3.11.2 Console Redirection Settings

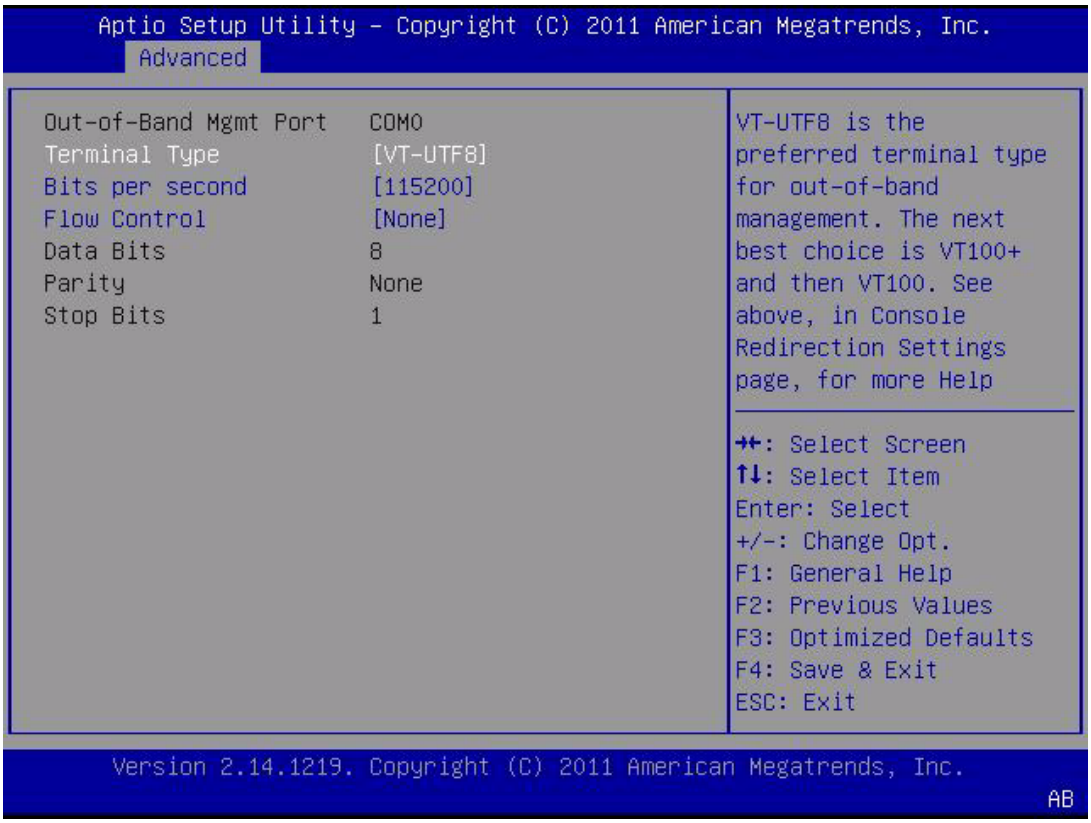

Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Advanced
Out-of-Band Mgmt Port COM0
Terminal Type [VT-UTF8]
Bits per second [115200]
Flow Control [None]
Data Bits 8
Parity None
Stop Bits 1
VT-UTF8 is the preferred terminal type for out-of-band management. The next best choice is VT100+ and then VT100. See above, in Console Redirection Settings page, for more Help
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
AB

**Figure 3.19 Console Redirection Settings**

**Terminal Type**

VT-UTF8 is the preferred terminal type for out-of-band management. The next best choice is VT100+ and then VT100. See above, in Console Redirection Settings page, for more Help with Terminal Type/Emulation.

**Bits per second**

Select the serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.

**Flow Control**

Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.

### 3.3.12 PPM Configuration

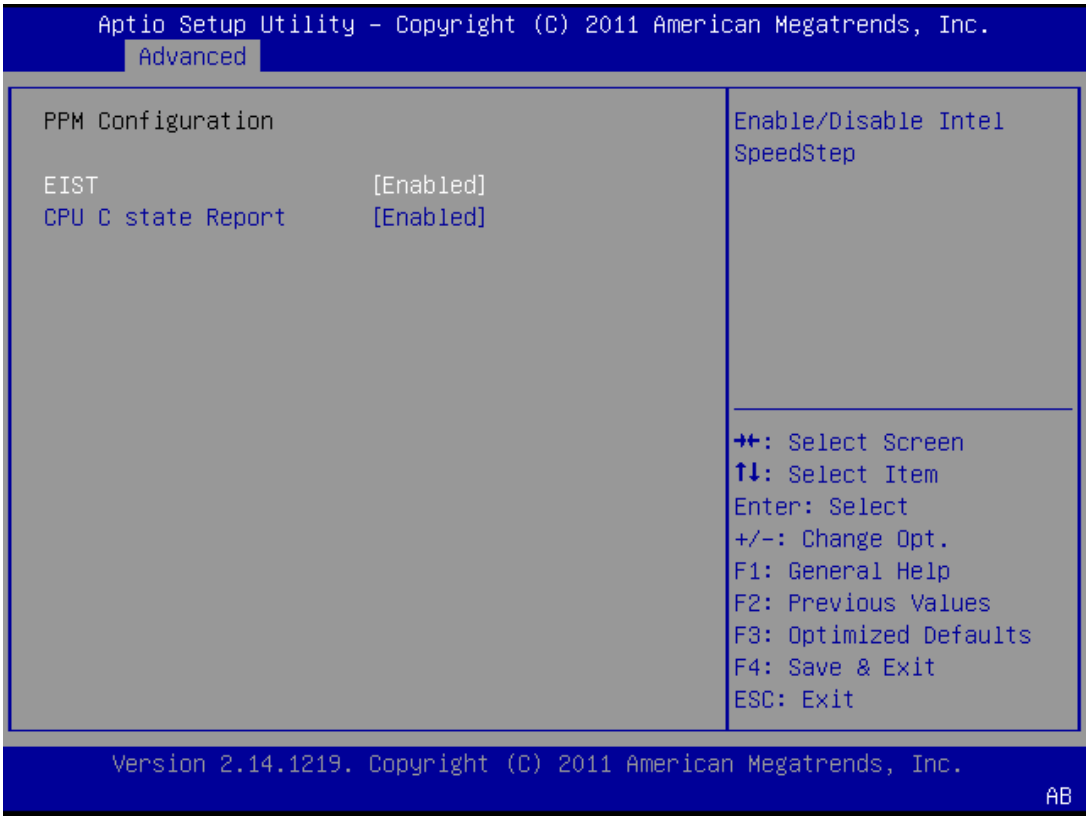



**Figure 3.20 PPM Configuration**

**EIST**

CPU runs at its default speed if disabled; CPU speed is controlled by the operating system if enabled.

**CPU C State Report**

This item allows users to enable or disable CPU C-state support.

## 3.4 Chipset

Select the Chipset tab from the SOM-7565 setup screen to enter the Chipset BIOS Setup screen. You can display a Chipset BIOS Setup option by highlighting it using the <Arrow> keys. All Plug and Play BIOS Setup options are described in this section. The Plug and Play BIOS Setup screen is shown below.

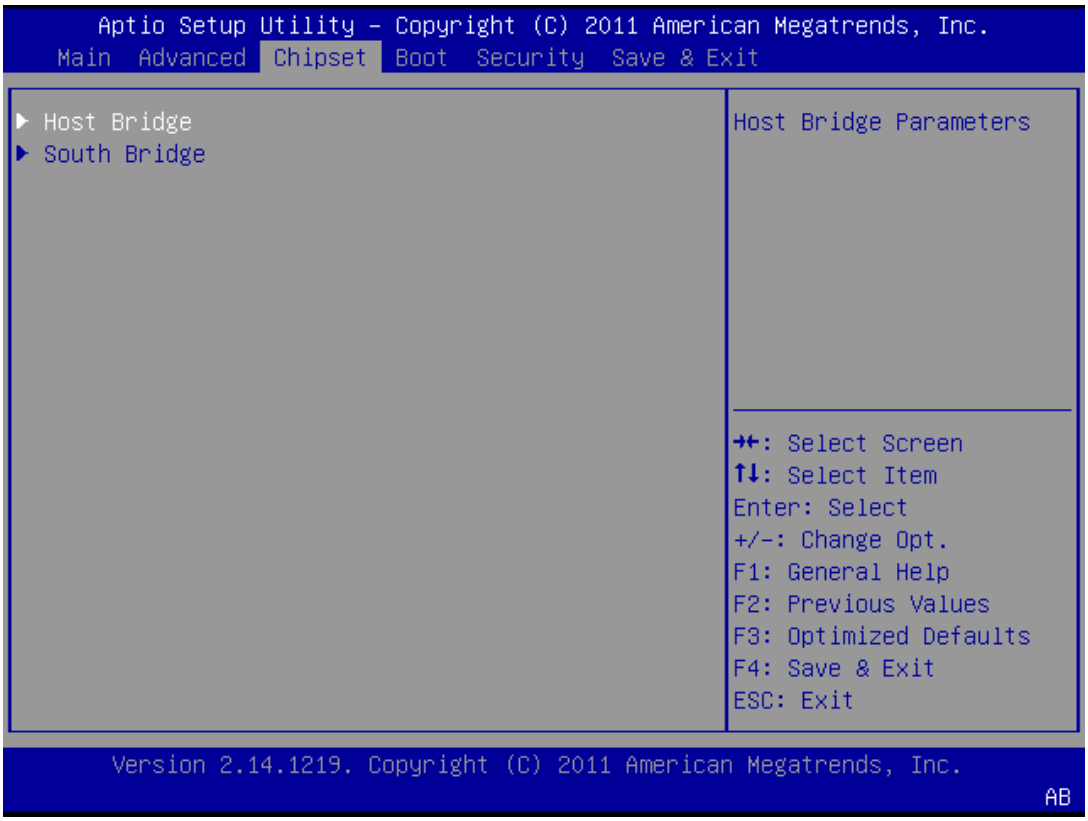



**Figure 3.21 Chipset Setup**

### 3.4.1 Intel IGD Configuration

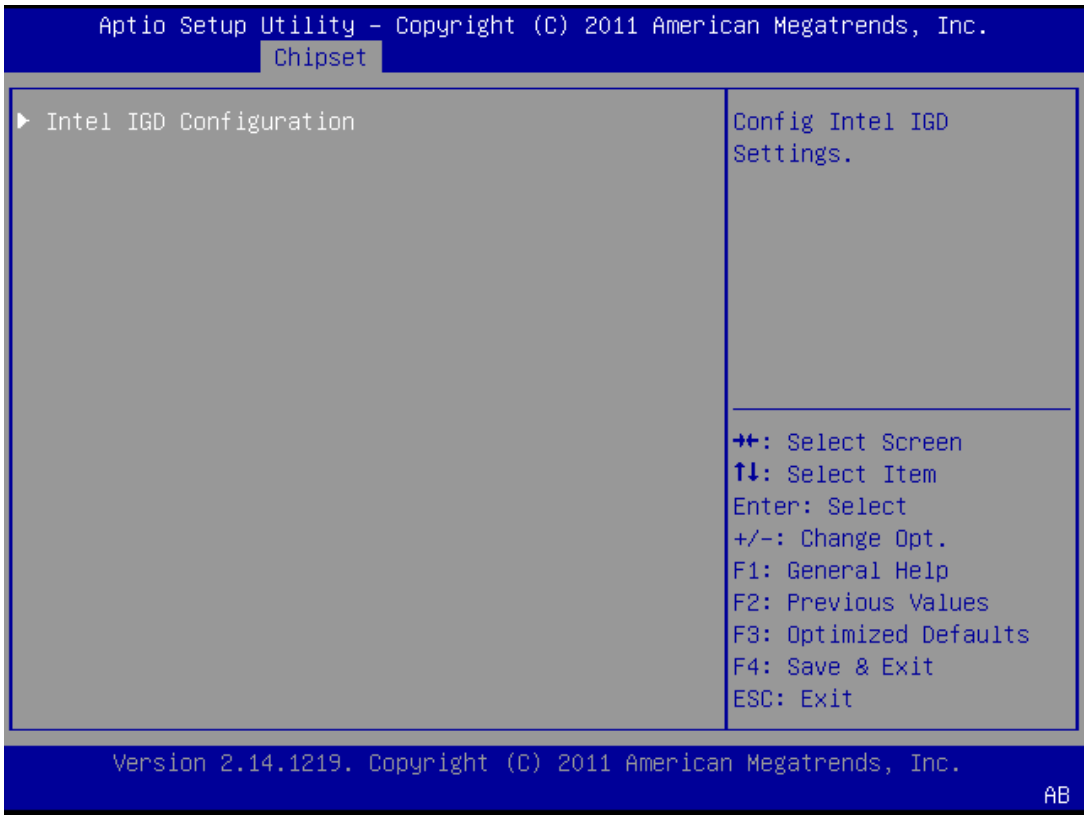



**Figure 3.22 Intel IGD Configuration**

**Intel IGD Configuration**

Config Intel IGD Settings.

#### 3.4.1.1 Intel IGD Configuration

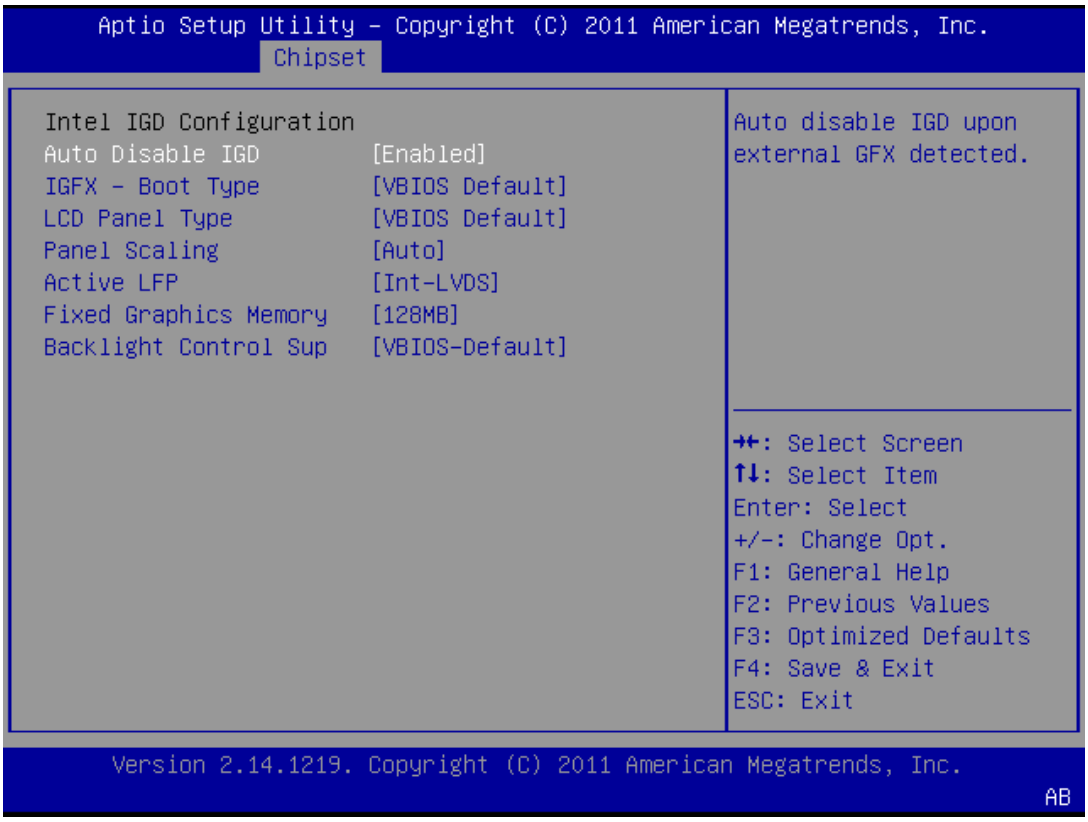



**Figure 3.23 Intel IGD Configuration**

**Auto Disable IGD**

Auto disable IGD upon external GFX detected.

**IGFX - Boot Type**

Select the Video Device which will be activated during POST. This has no effect if external graphics present.

**LCD Panel Type**

Select LCD panel used by Internal Graphics Device by selecting the appropriate setup item.

**Panel Scaling**

Select the LCD panel scaling option used by the Internal Graphics Device.

**Active LFP**

Select the Active LFP Configuration.

No LVDS:VBIOS does not enable LVDS.

Int-LVDS:VBIOS enables LVDS driver by Integrated encoder.

SDVO LVDS:VBIOS enables LVDS driver by SDVO encoder.

eDP Port-A:LFP Driven by Int-DisplayPort encoder from Port-A.

eDP Port-D:LFP Driven by Int-DisplayPort encoder from Port-D(through PCH).

**Fixed Graphics Memory Size**

Configure Fixed Graphics Memory Size

**Backlight Control Support**

Backlight Control Configuration

### 3.4.1.2 South Bridge

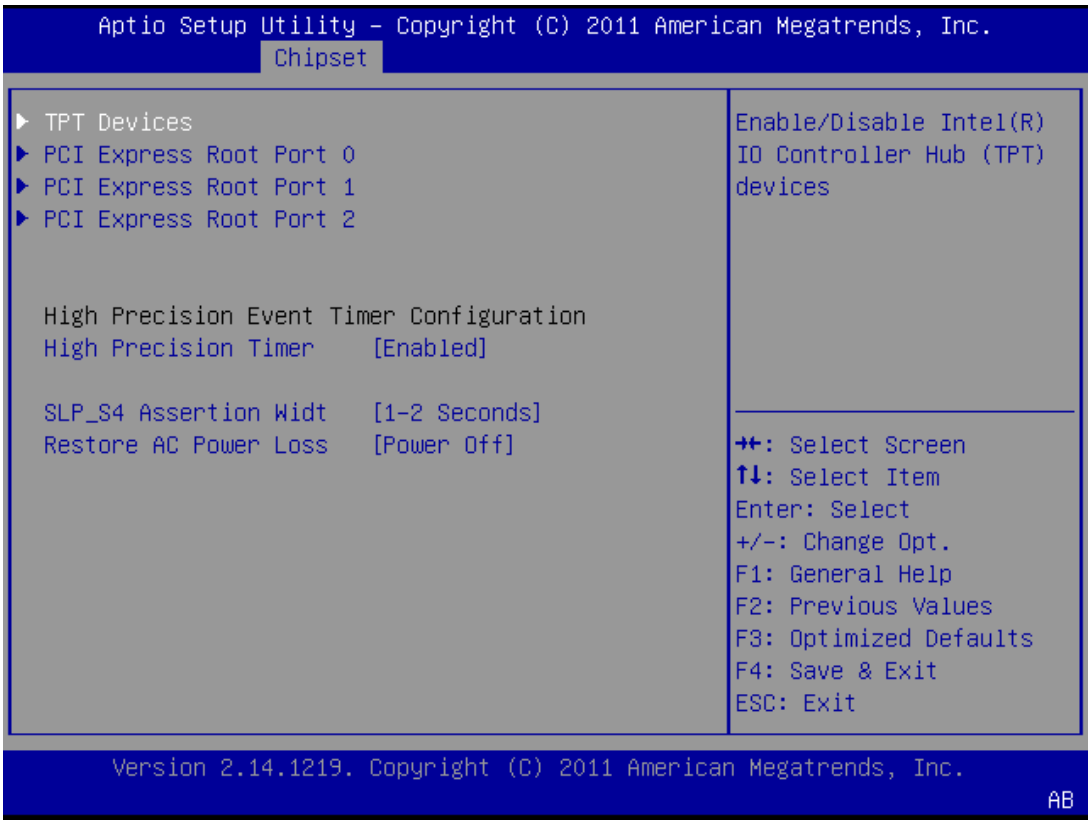

Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Chipset
TPT Devices
PCI Express Root Port 0
PCI Express Root Port 1
PCI Express Root Port 2
High Precision Event Timer Configuration
High Precision Timer [Enabled]
SLP_S4 Assertion Widt [1-2 Seconds]
Restore AC Power Loss [Power Off]
Enable/Disable Intel(R) IO Controller Hub (TPT) devices
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
AB

**Figure 3.24 South Bridge**

**TPT Devices**

Enable/Disable Intel(R) IO Controller Hub (TPT) devices.

**PCI Express Root Port 0**

PCI Express Root Port 0 Settings.

**PCI Express Root Port 1**

PCI Express Root Port 1 Settings.

**PCI Express Root Port 2**

PCI Express Root Port 2 Settings.

**High Precision Timer**

Enable or Disable the High Precision Event Timer.

**SLP_S4 Assertion Widt**

Select a minimum assertion width of the SLP_S4# signal

**Restore AC Power Loss**

Select AC power state when power is re-applied after a power failure.

### *TPT Devices*

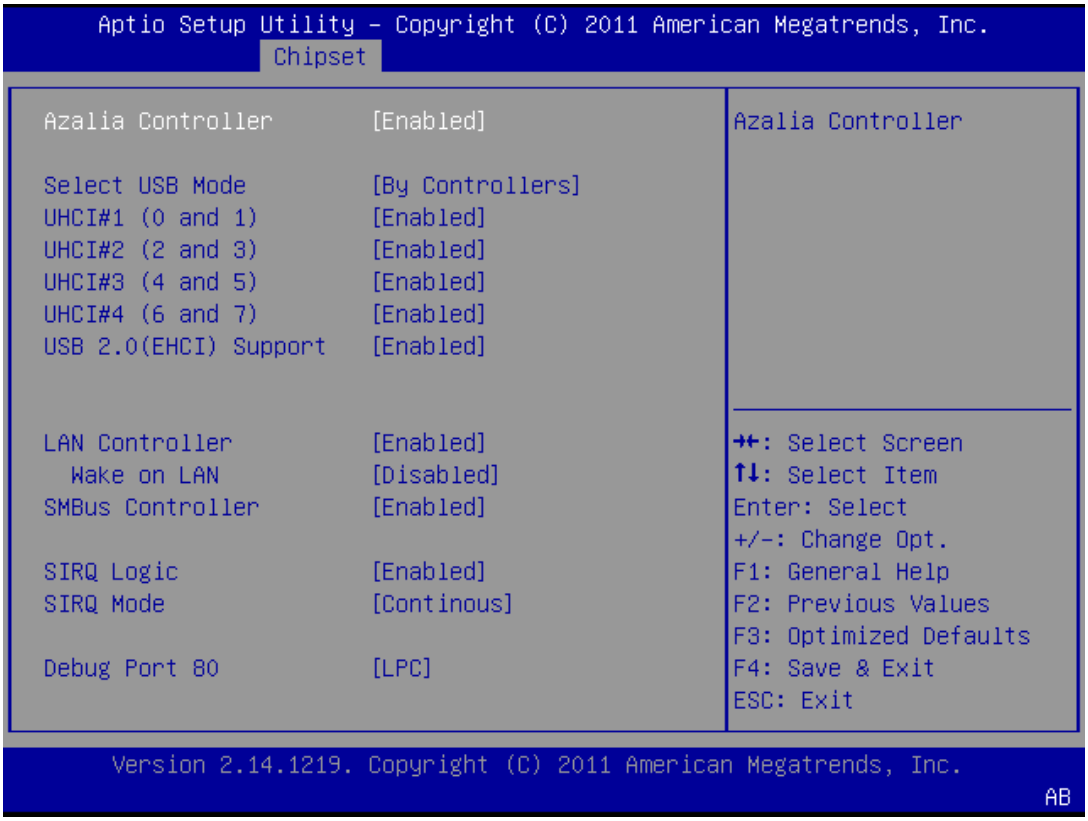



**Figure 3.25 TPT Devices**

**Azalia Controller**

Azalia Controller Enable/Disable

**Select USB Mode**

Select USB mode to control USB ports.

**UHCI#1 (0 and 1) / UHCI#2 (2 and 3) / UHCI#3 (4 and 5) / UHCI#4 (6 and 7)**

Control the USB UHCI (USB 1.1) functions.\n\nDisable from highest to lowest controller.

**USB 2.0(EHCI) Support**

Enable or Disable USB 2.0 (EHCI) Support.

**LAN Controller**

Enable or Disable OnChip NIC Controller.

**Wake on LAN**

Enable or disable PCIE LAN to wake the system.

**SMBus Controller**

Enable or Disable OnChip SMBus Controller.

**SIRQ Logic**

Enable or Disable SIRQ logic.

**SIRQ Mode**

Set SIRQ mode.

**Debug Port 80**

Show Debug Port 80 from PCI or LPC

***PCI Express Root Port 0***

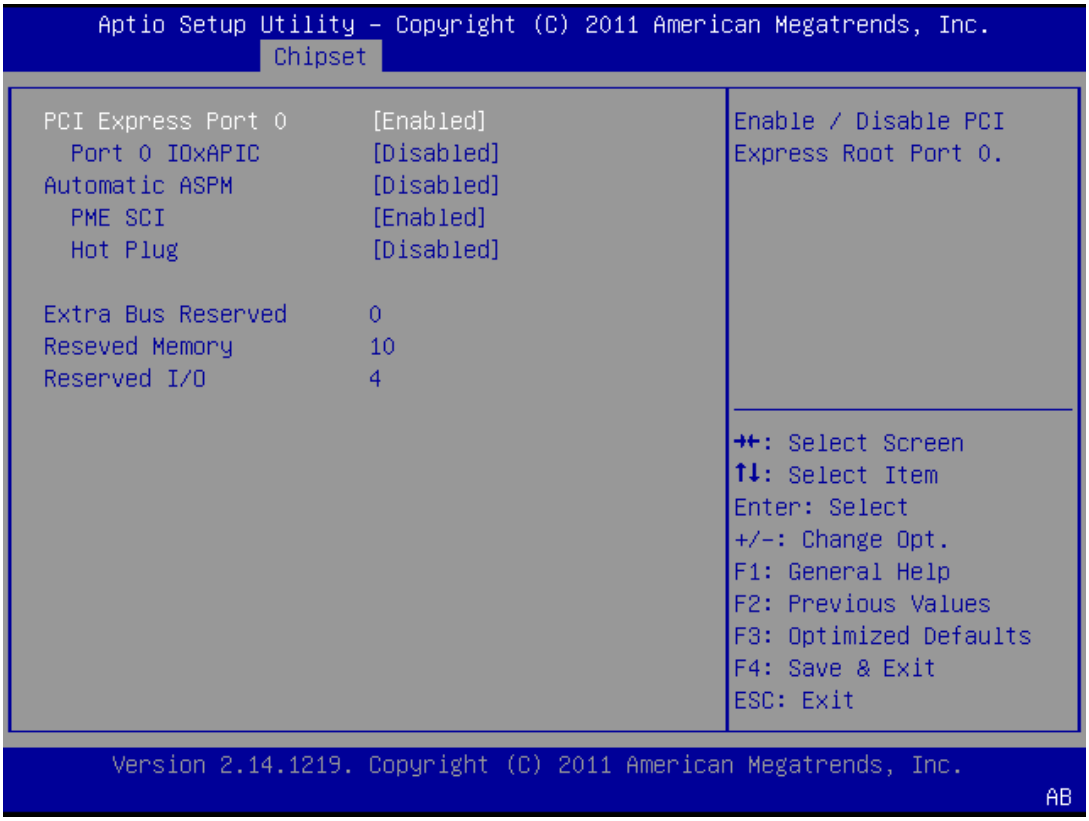



**Figure 3.26 PCI Express Root Port 0**

**PCI Express Prot 0**

Enable / Disable PCI Express Root Port 0.

**Prot 0 IOxAPIC**

Enable / Disable PCI Express Root Port 0 I/O APIC.

**Automatic ASPM**

Automatically enable ASPM based on reported capabilities and known issues.

**PME SCI**

PCI Express PME SCI Enable/Disable.

**Hot Plug**

PCI Express Hot Plug Enable/Disable.

**Extra Bus Reserved**

Extra Bus Reserved (0-7) for bridges behind this Root Bridge.

**Reseved Memory**

Reserved Memory and Prefetchable Memory (1-20MB) Range for this Root Bridge.

**Reserved I/O**

Reserved I/O (4K/8K/12K/16K/20K) Range for this Root Bridge.

### *PCI Express Root Port 1*

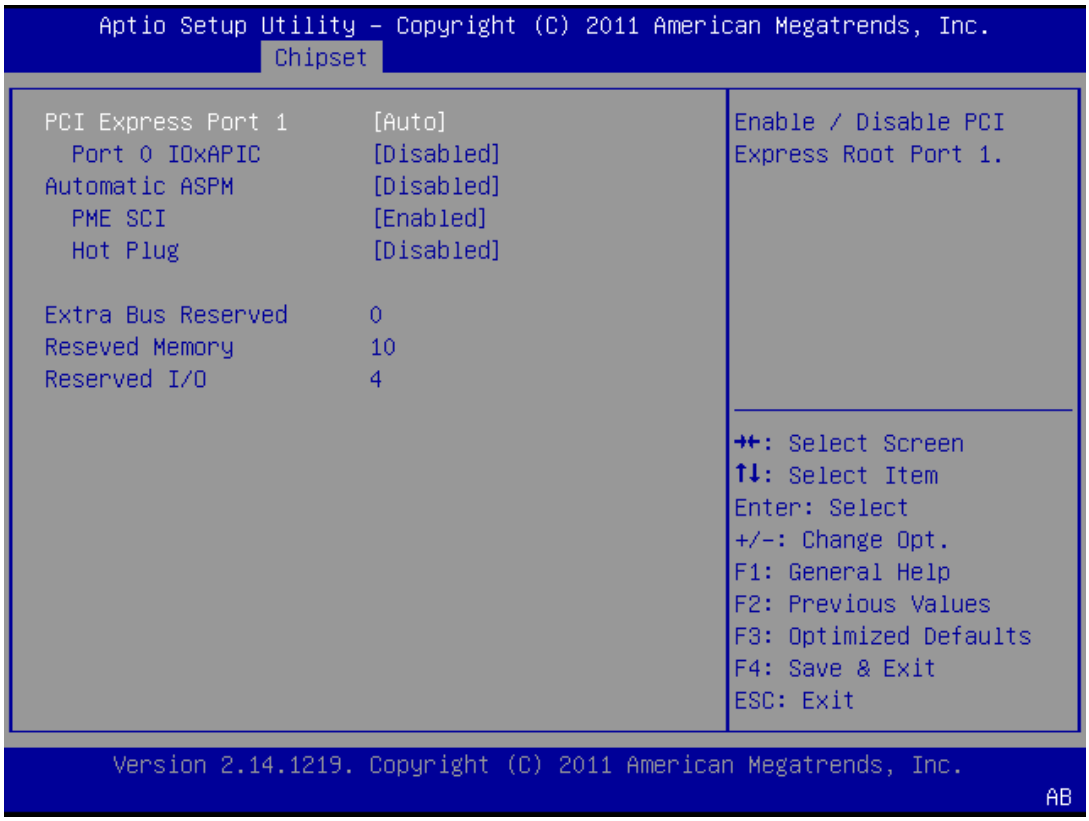



**Figure 3.27 PCI Express Root Port 1**

**PCI Express Prot 1**

Enable / Disable PCI Express Root Port 1.

**Prot 0 IOxAPIC**

Enable / Disable PCI Express Root Port 0 I/O APIC.

**Automatic ASPM**

Automatically enable ASPM based on reported capabilities and known issues.

**PME SCI**

PCI Express PME SCI Enable/Disable.

**Hot Plug**

PCI Express Hot Plug Enable/Disable.

**Extra Bus Reserved**

Extra Bus Reserved (0-7) for bridges behind this Root Bridge.

**Reseved Memory**

Reserved Memory and Prefetchable Memory (1-20MB) Range for this Root Bridge.

**Reserved I/O**

Reserved I/O (4K/8K/12K/16K/20K) Range for this Root Bridge.

***PCI Express Root Port 2***

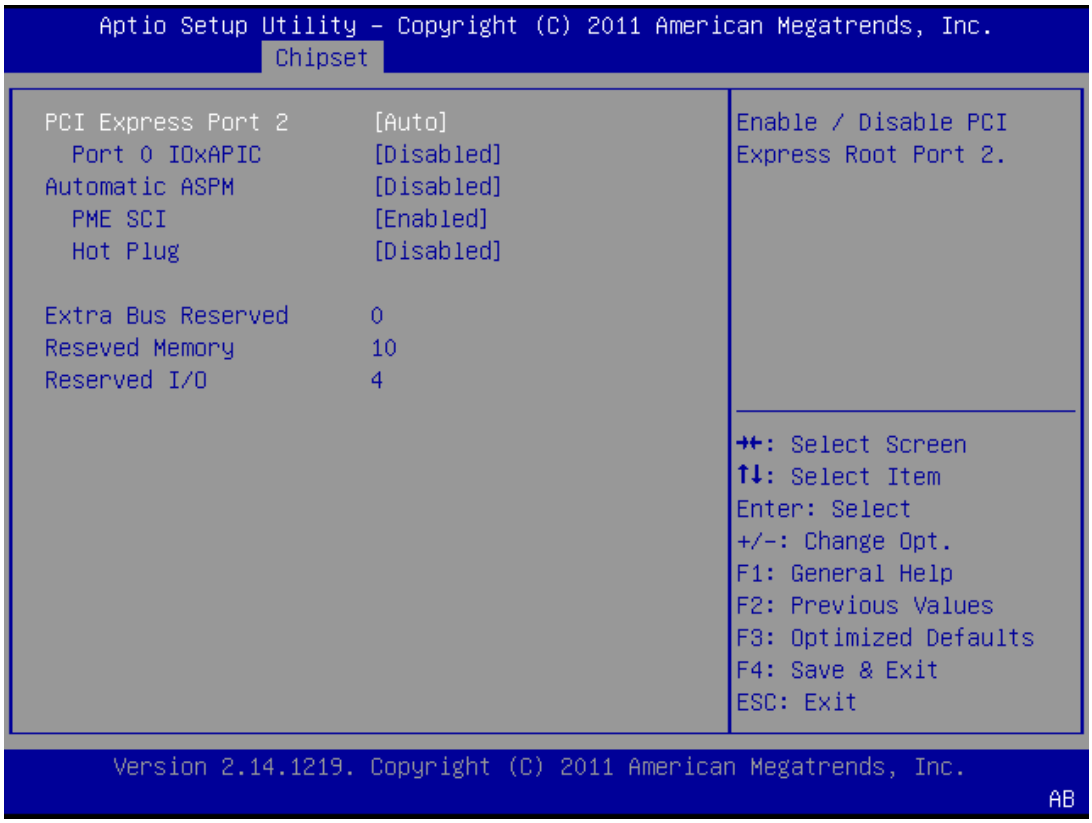



**Figure 3.28 PCI Express Root Port 2**

**PCI Express Prot 2**

Enable / Disable PCI Express Root Port 2.

**Prot 0 IOxAPIC**

Enable / Disable PCI Express Root Port 0 I/O APIC.

**Automatic ASPM**

Automatically enable ASPM based on reported capabilities and known issues.

**PME SCI**

PCI Express PME SCI Enable/Disable.

**Hot Plug**

PCI Express Hot Plug Enable/Disable.

**Extra Bus Reserved**

Extra Bus Reserved (0-7) for bridges behind this Root Bridge.

**Reseved Memory**

Reserved Memory and Prefetchable Memory (1-20MB) Range for this Root Bridge.

**Reserved I/O**

Reserved I/O (4K/8K/12K/16K/20K) Range for this Root Bridge.

## 3.5 Boot Settings

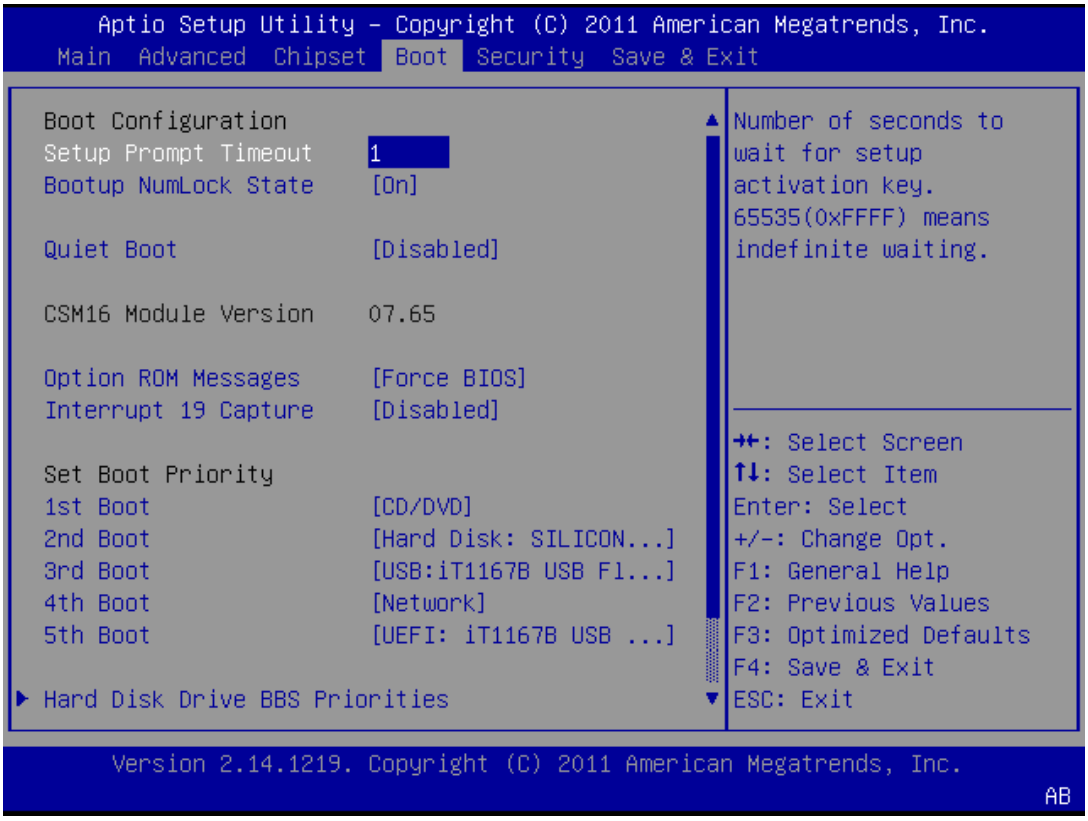

Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
Boot Configuration
Setup Prompt Timeout 1
Bootup NumLock State [On]
Quiet Boot [Disabled]
CSM16 Module Version 07.65
Option ROM Messages [Force BIOS]
Interrupt 19 Capture [Disabled]
Set Boot Priority
1st Boot [CD/DVD]
2nd Boot [Hard Disk: SILICON...]
3rd Boot [USB:iT1167B USB Fl...]
4th Boot [Network]
5th Boot [UEFI: iT1167B USB ...]
Hard Disk Drive BBS Priorities
Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
AB

**Figure 3.29 Boot Setup Utility**

**Setup Prompt Timeout**

This item allows users to select the number of seconds to wait for setup activation key.

**Bootup NumLock State**

Select the Power-on state for Numlock.

**Quiet Boot**

If this option is set to Disabled, the BIOS displays normal POST messages. If Enabled, an OEM Logo is shown instead of POST messages.

**Option ROM Message**

Set display mode for option ROM.

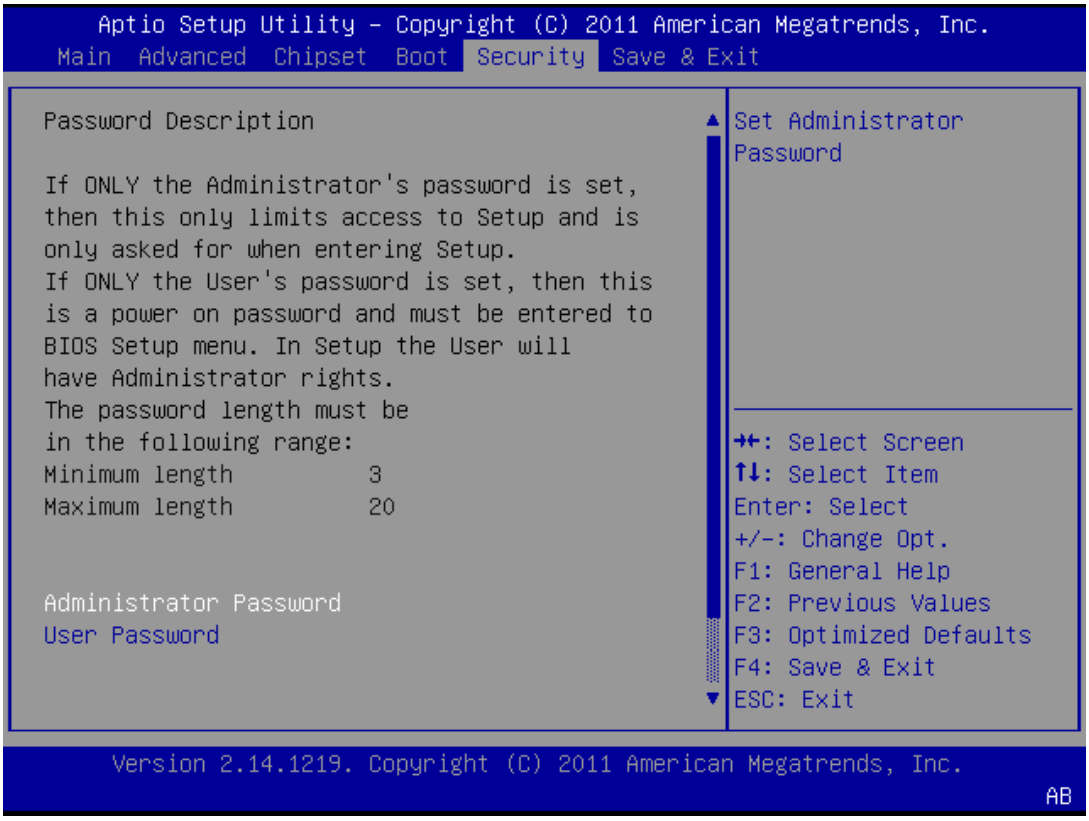
**Interrupt 19 Capture**

This item allows option ROMs to trap interrupt 19.

**$1^{st}/2^{nd}/3^{rd}/4^{th}/5^{th}$ Boot**

This item allows users to set boot device priority.

## 3.6 Security Setup


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
Password Description
If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup.
If ONLY the User's password is set, then this is a power on password and must be entered to BIOS Setup menu. In Setup the User will have Administrator rights.
The password length must be in the following range:
Minimum length 3
Maximum length 20
Administrator Password
User Password
Set Administrator Password
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
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AB

**Figure 3.30 Password Configuration**

Select Security Setup from the SOM-7565 Setup main BIOS setup menu. All Security Setup options, such as password protection is described in this section. To access the sub menu for the following items, select the item and press <Enter>:

**Change Administrator / User Password:** Select this option and press <ENTER> to access the sub menu, and then type in the password.

## 3.7 Save & Exit

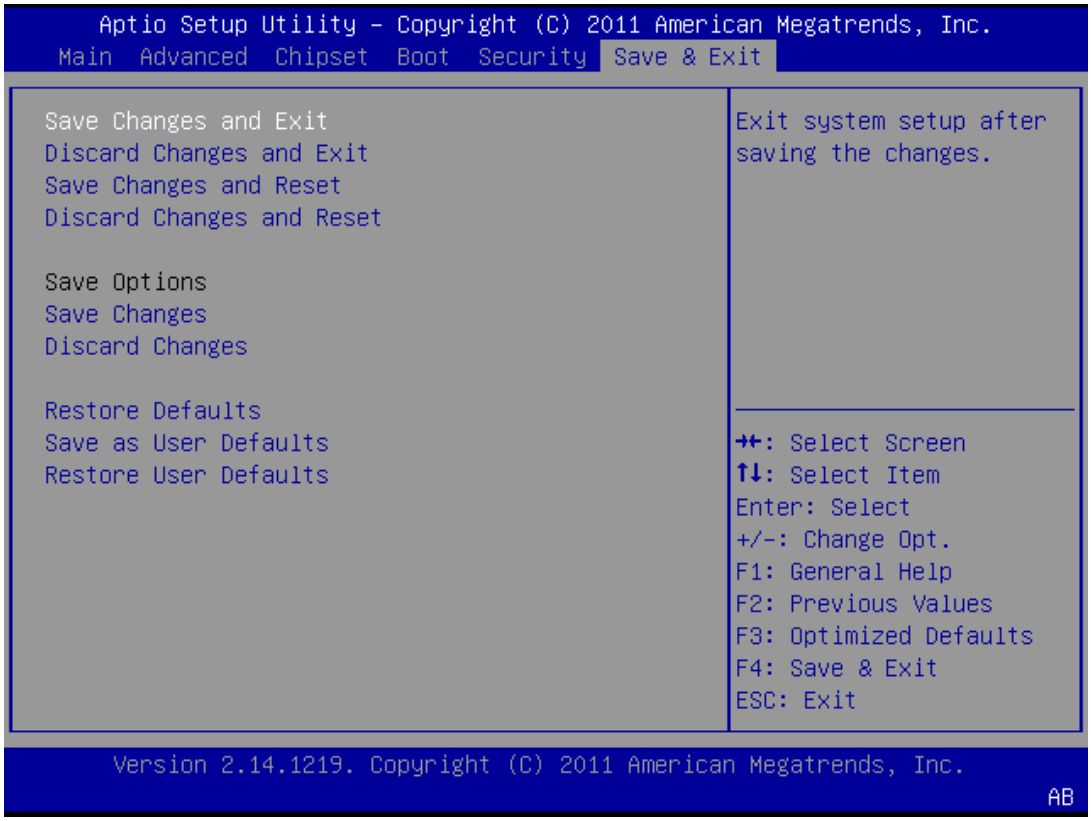


**Figure 3.31 Save & Exit**

### 3.7.1 Save Changes and Exit

When users have completed system configuration, select this option to save changes, exit BIOS setup menu and reboot the computer if necessary to take effect all system configuration parameters.

### 3.7.2 Discard Changes and Exit

Select this option to quit Setup without making any permanent changes to the system configuration.

### 3.7.3 Save Changes and Reset

When users have completed system configuration, select this option to save changes, exit BIOS setup menu and reboot the computer to take effect all system configuration parameters.

### 3.7.4 Discard Changes and Reset

Select this option to quit Setup without making any permanent changes to the system configuration and reboot the computer.

### 3.7.5 Save Changes

When users have completed system configuration, select this option to save changes without exit BIOS setup menu.

### 3.7.6 Discard Changes

Select this option to discard any current changes and load previous system configuration.

### 3.7.7 Restore Defaults

The SOM-7565 automatically configures all setup items to optimal settings when users select this option. Optimal Defaults are designed for maximum system performance, but may not work best for all computer applications. In particular, do not use the Optimal Defaults if the user's computer is experiencing system configuration problems.

### 3.7.8 Save User Defaults

When users have completed system configuration, select this option to save changes as user defaults without exit BIOS setup menu.

### 3.7.9 Restore User Defaults

The users can select this option to restore user defaults.

# Chapter 4

## S/W Introduction & Installation

**Sections include:**

- S/W Introduction
- Driver Installation
- Advantech iManger

## 4.1 S/W Introduction

The mission of Advantech Embedded Software Services is to “Enhance quality of life with Advantech platforms and Microsoft Windows embedded technology." We enable Windows Embedded software products on Advantech platforms to more effectively support the embedded computing community. Customers are freed from the hassle of dealing with multiple vendors (Hardware suppliers, System integrators, Embedded OS distributor) for projects. Our goal is to make Windows Embedded Software solutions easily and widely available to the embedded computing community.

## 4.2 Driver Installation

The Intel Chipset Software Installation (CSI) utility installs the Windows INF files that outline to the operating system how the chipset components will be configured.

### 4.2.1 Windows XP / Windows 7 Driver Setup

To install the drivers please connect to internet and browse the website http://support.advantech.com.tw and download the drivers that you want to install and follow Driver Setup instructions to complete the installation.

### 4.2.2 Other OS

To install the drivers for Other Windows OS or Linux, please connect to internet and browse the browse the website http://support.advantech.com.tw to download the setup file.

## 4.3 Advantech iManager

Advantech's platforms come equipped with iManager, a micro controller that provides embedded features for system integrators. Embedded features have been moved from the OS/BIOS level to the board level, to increase reliability and simplify integration. iManager runs whether the operating system is running or not; it can count the boot times and running hours of the device, monitor device health, and provide an advanced watchdog to handle errors just as they happen. iManager also comes with a secure & encrypted EEPROM for storing important security key or other customer define information. All the embedded functions are configured through API and provide corresponding utilities to demonstrate. These APIs comply with PICMG EAPI (Embedded Application Programmable Interface) specification and unify in the same structures. It makes these embedded features easier to integrate, speed up developing schedule, and provide the customer's software continuity while upgrade hardware. More detail of how to use the APIs and utilities, please refer to Advantech iManager 2.0 Software API User Manual.

### Control

**GPIO**

General Purpose Input/Output is a flexible parallel interface that allows a variety of custom connections. It allows users to monitor the level of signal input or set the output status to switch on/off a device. Our API also provides Programmable GPIO, which allows developers to dynamically set the GPIO input or output status.

**SMBus**

SMBus is the System Management Bus defined by Intel® Corporation in 1995. It is used in personal computers and servers for low-speed system management communications. The SMBus API allows a developer to interface a embedded system environment and transfer serial messages using the SMBus protocols, allowing multiple simultaneous device control.

**I²C**

I²C is a bi-directional two wire bus that was developed by Philips for use in their televisions in the 1980s.
The I²C API allows a developer to interface with an embedded system environment and transfer serial messages using the I²C protocols, allowing multiple simultaneous device control.

### Display

**Brightness Control**

The Brightness Control API allows a developer to interface with an embedded device to easily control brightness.

**Backlight**

The Backlight API allows a developer to control the backlight (screen) on/off in an embedded device.

### Monitor

**Watchdog**

A watchdog timer (WDT) is a device that performs a specific operation after a certain period of time if something goes wrong and the system does not recover on its own.
A watchdog timer can be programmed to perform a warm boot (restarting the system) after a certain number of seconds.

**Hardware Monitor**

The Hardware Monitor (HWM) API is a system health supervision API that inspects certain condition indexes, such as fan speed, temperature and voltage.

**Hardware Control**

The Hardware Control API allows developers to set the PWM (Pulse Width Modulation) value to adjust fan speed or other devices; it can also be used to adjust the LCD brightness.

### Power Saving

**CPU Speed**

Make use of Intel SpeedStep technology to reduce power power consumption. The system will automatically adjust the CPU Speed depending on system loading.

**System Throttling**

Refers to a series of methods for reducing power consumption in computers by lowering the clock frequency. These APIs allow the user to lower the clock from 87.5% to 12.5%.

# Appendix A

## Watchdog Timer

This appendix gives you the information about the watchdog timer programming on the SOM-7565 CPU System on Module

Sections include:

- Watchdog Timer Programming

# A.1 Programming the Watchdog Timer

| Trigger Event | Note |
|---|---|
| IRQ | IRQ5, 7, 14 (default disable) IRQ can be set in BIOS |
| NMI | N/A |
| SCI | Power button event |
| Power Off | Support |
| H/W Restart | Support |
| External WDT | N/A |

For details, please refer to iManager & Software API User Manual:

# Appendix B

## Programming GPIO

This Appendix gives the illustration of the General Purpose Input and Output pin setting.

Sections include:

- System I/O ports

## B.1 GPIO Register

| GPIO Byte Mapping | H/W Pin Name |
|---|---|
| BIT0 | GPO0 |
| BIT1 | GPO1 |
| BIT2 | GPO2 |
| BIT3 | GPO3 |
| BIT4 | GPI0 |
| BIT5 | GPI1 |
| BIT6 | GPI2 |
| BIT7 | GPI3 |

For details, please refer to iManager & Software API User Manual

# Appendix C

## System Assignments

This appendix gives you the information about the system resource allocation on the SOM-7565 CPU System on Module.

Sections include:

- System I/O ports
- DMA Channel Assignments
- Interrupt Assignments
- 1st MB Memory Map

# C.1 System I/O Ports

**Table C.1: System I/O ports**

| Addr.range(Hex) | Device |
|---|---|
| 0000 - 000F | Direct memory access controller |
| 0000 - 0CF7 | PCI bus |
| 0010 - 001F | Motherboard resources |
| 0020 - 0021 | Programmable interrupt controller |
| 0022 - 003F | Motherboard resources |
| 0040 - 0043 | System timer |
| 0044 - 005F | Motherboard resources |
| 0060 - 0060 | Standard 101/102-Key or Microsoft Natural PS/2 Keyboard |
| 0061 - 0061 | System speaker |
| 0062 - 0062 | Microsoft ACPI-Compliant Embedded Controller |
| 0063 - 0063 | Motherboard resources |
| 0064 - 0064 | Standard 101/102-Key or Microsoft Natural PS/2 Keyboard |
| 0065 - 0065 | Motherboard resources |
| 0066 - 0066 | Microsoft ACPI-Compliant Embedded Controller |
| 0067 - 006F | Motherboard resources |
| 0070 - 0071 | System CMOS/real time clock |
| 0072 - 007F | Motherboard resources |
| 0080 - 0080 | Motherboard resources |
| 0081 - 0083 | Direct memory access controller |
| 0084 - 0086 | Motherboard resources |
| 0087 - 0087 | Direct memory access controller |
| 0088 - 0088 | Motherboard resources |
| 0089 - 008B | Direct memory access controller |
| 008C - 008E | Motherboard resources |
| 008F - 008F | Direct memory access controller |
| 0090 - 009F | Motherboard resources |
| 00A0 - 00A1 | Programmable interrupt controller |
| 00A2 - 00BF | Motherboard resources |
| 00C0 - 00DF | Direct memory access controller |
| 00E0 - 00EF | Motherboard resources |
| 00F0 - 00FF | Numeric data processor |
| 01F0 - 01F7 | Primary IDE Channel |
| 0274 - 0277 | ISAPNP Read Data Port |
| 0279 - 0279 | ISAPNP Read Data Port |
| 0378 - 037F | Parallel port (LPT1) N455 CPU only |
| 03B0 - 03BB | Intel(R) Graphic Media Accelerator 3150 |
| 03C0 - 03DF | Intel(R) Graphic Media Accelerator 3150 |
| 03F6 - 03F6 | Primary IDE Channel |
| 03F8 - 03FF | Communications Port (COM1) |
| 0400 - 041F | Intel(R) ICH8 Family SMBus Controller ®C 283E |
| 04D0 - 04D1 | Motherboard resources |
| 0500 - 053F | Motherboard resources |
| 0800 - 087F | Motherboard resources |

| Table C.1: System I/O ports | |
|---|---|
| 0A00 - 0A0F | Motherboard resources |
| 0A79 - 0A79 | ISAPNP Read Data Port |
| 0D00 - FFFF | PCI bus |
| D080 - D087 | Intel(R) Graphic Media Accelerator 3150 |
| D400 - D41F | Intel 82567V-3 Gigabit Network Connection |
| D480 - D49F | Standard Universal PCI to USB Host Controller |
| D800 - D81F | Intel ICH8 Family USB Universal Host Controller - 2832 |
| D880 - D89F | Intel ICH8 Family USB Universal Host Controller - 2831 |
| DC00 - DC1F | Intel ICH8 Family USB Universal Host Controller - 2830 |
| E080 - E08F | Intel ICH8M 3 port Serial ATA Storage Controller - 2828 |
| E400 - E40F | Intel ICH8M 3 port Serial ATA Storage Controller - 2828 |
| E480 - E483 | Intel ICH8M 3 port Serial ATA Storage Controller - 2828 |
| E800 - E807 | Intel ICH8M 3 port Serial ATA Storage Controller - 2828 |
| E880 - E883 | Intel ICH8M 3 port Serial ATA Storage Controller - 2828 |
| EC00 - EC07 | Intel ICH8M 3 port Serial ATA Storage Controller - 2828 |
| FFA0 - FFAF | Intel ICH8M Ultra ATA Storage Controller - 2850 |

## C.2 DMA Channel Assignments

| Table C.2: DMA channel assignments | |
|---|---|
| **Channel** | **Function** |
| 0 | Available |
| 1 | Available |
| 2 | Available |
| 3 | Available |
| 4 | Direct memory access controller |
| 5 | Available |
| 6 | Available |
| 7 | Available |

## C.3 Interrupt Assignments

| Table C.3: Interrupt assignments | |
|---|---|
| **Interrupt#** | **Interrupt source** |
| NMI | Parity error detected |
| IRQ 0 | System timer |
| IRQ 1 | Standard 101/102-Key or Microsoft Natural PS/2 Keyboard |
| IRQ2 | Available |
| IRQ3 | Available |
| IRQ 4 | Communications Port (COM1) |
| IRQ 5 | Available |
| IRQ 6 | Available |
| IRQ 7 | Available |
| IRQ 8 | System CMOS/real time clock |

| Table C.3: Interrupt assignments | |
|---|---|
| IRQ 9 | Microsoft ACPI-Compliant System |
| IRQ 10 | Available |
| IRQ 11 | Available |
| IRQ 12 | PS/2 Compatible Mouse |
| IRQ 13 | Numeric data processor |
| IRQ 14 | Primary IDE Channel |
| IRQ 15 | Available |
| IRQ 16 | Intel(R) Graphic Media Accelerator 3150 |
| IRQ 16 | Standard Universal PCI to USB Host Controller |
| IRQ 18 | Intel(R) ICH8 Family USB Universal Host Controller - 2832* |
| IRQ 18 | Intel(R) ICH8M 3 port Serial ATA Host Controller - 2828 |
| IRQ 19 | Intel(R) ICH8 Family USB Universal Host Controller - 2831* |
| IRQ 21 | Microsoft UAA Bus Driver for High Definition Audio |
| IRQ 23 | Intel(R) 82567V-3 Gigabit Network Connection* |
| IRQ 23 | Intel ICH8 Family USB Universal Host Controller - 2830* |
| IRQ 23 | Intel ICH8 Family USB2 Universal Host Controller - 2836* |

*USB and Ethernet IRQ is automatically set by the system.

## C.4 1st MB Memory Map

| Table C.4: 1st MB memory map | |
|---|---|
| **Addr. range (Hex)** | **Device** |
| 00000000 - 0009FFFF | System board |
| 000A0000 - 000BFFFF | Intel(R) Graphic Media Accelerator 3150 |
| 000A0000 - 000BFFFF | PCI Bus |
| 000C0000 - 000CFFFF | System board |
| 000D0000 - 000DFFFF | PCI bus |
| 000E0000 - 000FFFFF | System board |
| 00100000 - 7F6FFFFF | System board |
| 7F700000 - DFFFFFFF | PCI Bus |
| D0000000 - DFFFFFFF | Intel(R) Graphic Media Accelerator 3150 |
| E0000000 - EFFFFFFF | Motherboard resource |
| F0000000 - FED8FFFF | PCI Bus |
| FE980000 - FE9FFFFF | Intel(R) Graphic Media Accelerator 3150 |
| FEA00000 - FEAFFFFF | Intel(R) Graphic Media Accelerator 3150 |
| FEB00000 - FEB7FFFF | Intel(R) Graphic Media Accelerator 3150 |
| FEBC0000 - FEBDFFFF | Intel 82567V-3 Gigabit Network Connection |
| FEBF8000 - FEBFBFFF | Microsoft UAA Bus Driver for High Definition Audio |
| FEBFE000 - FEBFEFFF | Intel 82567V-3 Gigabit Network Connection |
| FEBFF800 - FEBFFBFF | Intel ICH8 Family USB2 Enhanced Host Controller - 2836 |
| FEBFFC00 - FEBFFCFF | Intel ICH8 Family SMBus Controller ®C 283E |
| FEC00000 - FEC00FFF | Motherboard resources |
| FED00000 - FED003FF | HPET (High Precision Event Timer) |
| FED14000 - FED19FFF | System board |
| FED1C000 - FED1FFFF | Motherboard resources |

| Table C.4: 1st MB memory map | |
|---|---|
| FED20000 - FED3FFFF | Motherboard resources |
| FED40000 - FED8FFFF | Motherboard resources |
| FED90000 - FED93FFF | System board |
| FED90000 - FFFFFFFF | System board |
| FEE00000 - FEE00FFF | Motherboard resources |
| FFB00000 - FFBFFFFF | Intel 82802 Firmware Hub Device |
| FFC00000 - FFEFFFFF | Motherboard resources |
| FFF00000 - FFFFFFFF | Intel 82802 Firmware Hub Device |

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